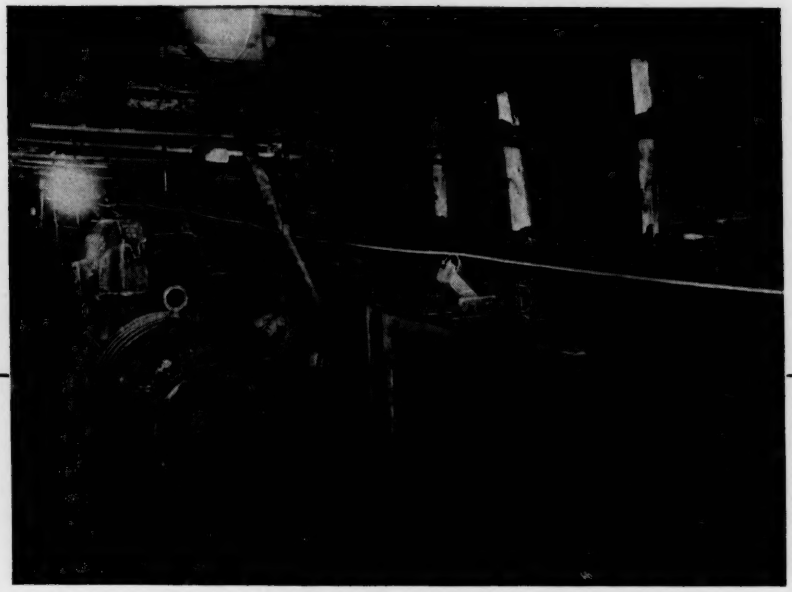
The Mining Journal

Established 1835 — Railway & Commercial Gazette

Vol. CCXLI No. 6156 — LONDON, AUGUST 14, 1953 — Price 8d.

Flameproof colliery motors



'ENGLISH ELECTRIC' flameproof colliery motors have been developed to meet the requirements of mining engineers for medium-sized motors of exceptionally strong construction. In all stages of the design, consideration has been given to the robustness and durability needed to withstand the most arduous colliery conditions.

The illustration shows an 'ENGLISH ELECTRIC' 40 h.p. 960 r.p.m. 500 volt, 3-phase, 50 cycle, flameproof motor driving a Distington-Goodman type 30" troughed belt conveyor through reduction gears.

'ENGLISH ELECTRIC'

colliery motors

ENGINEERING, MARINE & WELDING EXHIBITION: OLYMPIA—SEPT. 3rd-17th—Visit our Stands

THE ENGLISH ELECTRIC COMPANY LIMITED, QUEENS HOUSE, KINGSWAY, LONDON, W.C.2

Industrial Motor Works, Bradford

WORKS: STAFFORD · PRESTON · RUGBY · BRADFORD · LIVERPOOL · ACCRINGTON

CM.3

DENVER *coal flotation*

Over 34,000 Denver "Sub-A" Flotation Machines are in use throughout the world. Our illustration shows a recent installation carried out by Messrs. Simon-Carves Ltd. In this coal preparation plant, two Denver Super Agitators are conditioning the slurry prior to flotation.

Denver "Sub-A" Flotation Machines are in universal use because they are adaptable to all kinds of flotation problems and possess the correct fundamental principles necessary for high recovery. Rugged simplicity of construction ensures reliability and long service even under the most arduous conditions.

Write for Bulletin F10-B50.

STANDARD RELIABLE 24 HOUR SERVICE EFFICIENT

"The firm that makes its friends happier, healthier, and wealthier"

DENVER EQUIPMENT CO., LTD.
SALISBURY HOUSE • LONDON, EC2, ENGLAND

DENVER 17, COLORADO P.O. Box 5268
NEW YORK CITY 1, N.Y.: 4114 Empire State Bldg.
CHICAGO 1: 1123 Bell Bldg., 307 N. Michigan
TORONTO, ONTARIO 220 Bay Street
VANCOUVER, B.C.: 305 Credit Foncier Bldg.
MEXICO, D.F.: Edificio Pedro de Gante, Gante 7
LONDON, EC2, ENGLAND: Salisbury House
JOHANNESBURG, S. AFRICA: 8 Village Road
RICHMOND, AUSTRALIA: 530 Victoria Street

Telephone MONarch 0445
Cables DECOLON-LONDON

TIB, 58

WOLVERHAMPTON DIAMOND DIE & TOOL Co. Ltd.

BOARTS and INDUSTRIAL DIAMONDS Exporters

11 HATTON GARDEN, LONDON, E.C.1

Telephone: **HOLborn 3017** *Cables:* **Pardimon, London**

TEXOLEX

SAFETY HELMETS

TEXOLEX

Produced to World Standards

LIGHT AND HEAVYWEIGHT MODELS AVAILABLE

STANDARD DESIGN

- SCIENTIFICALLY DESIGNED
- HIGH PRESSURE MOULDED SHELL (Laminated Fabric)
- LIGHTWEIGHT, IMMENSE STRENGTH
- IMPERVIOUS TO WATER AND HEAT
- ELECTRICALLY NON-CONDUCTING

If you require a Safety Hat to withstand a 40 foot-pound impact load enquire from:—

MALCOLM CAMPBELL (PLASTICS) LTD

5 GREAT JAMES STREET - LONDON, W.C.I, ENGLAND
Telephones - - - Holborn 5623 · 0931 - Chancery 8383

Triefus
DIAMOND DRILL BITS
† Effective sludge clearance
† The diamond pattern ensures that the sludge is cleanly removed from the working face of the bit.
TRIEFUS & CO. LTD. (WORKS) BELSIZE LANE, LONDON, N.W.3
Telephone: Primrose 3368 Telegrams and Cables: Resets, London

Bank of British West Africa Limited

Established 1894

AUTHORISED CAPITAL - £4,000,000
SUBSCRIBED CAPITAL - £3,000,000
PAID UP CAPITAL - - £1,200,000
RESERVE FUND - - £1,100,000

BANKERS TO THE GOVERNMENTS OF THE COLONIES OF THE GAMBIA, SIERRA LEONE, GOLD COAST AND NIGERIA
The Rt. Hon. LORD HARLECH, K.G., G.C.M.G., Chairman

Head Office:
37 GRACECHURCH STREET, LONDON E.C.3
General Manager: F. G. WRIGHT Secretary: E. J. D. KEWLEY

LIVERPOOL 25, Water Street
MANCHESTER 106-108, Portland Street
HAMBURG Schauenburgerstr 49

GAMBIA - -	Bathurst	
SIERRA LEONE -	Freetown	
	Bo	
GOLD COAST & ASHANTI, AND B.M.T.	Accra (High Street)	Sekondi
	Accra (Tudu)	Sunyani
	Cape Coast	Swedru
	Dunkwa	Takoradi—(Harbour)
	Hohoe	Takoradi—(Market Circle)
	Keta	Tamale
	Koforidua	Tarkwa
	Kumasi	Winneba
	Oda	
CAMEROONS -	Duala	

NIGERIA - -	Aba	Kano—(Airport)
	Abeokuta	Lagos—(Marina)
	Apapa	Lagos—(Broad St.)
	Benin	Maiduguri
	Calabar	Onitsha
	Enugu	Oshogbo
	Gusau	Port Harcourt
	Ibadan	Sapele
	Ilesha	Sokoto
	Jos	Warri
	Kaduna	Zaria
	Kano	
MOROCCO - -	Tangier	

Agents in New York: THE STANDARD BANK OF SOUTH AFRICA LTD.
Every description of banking business undertaken
The Bank provides exceptional facilities for financing trade with West Africa
Principal Shareholders:
LLOYDS BANK LTD. NATIONAL PROVINCIAL BANK LTD
THE STANDARD BANK OF SOUTH AFRICA LTD. WESTMINSTER BANK LTD.

Premier
PLANT AND HIRE CO., LTD

48, BURLINGTON ROAD, ISLEWORTH, MIDDLESEX

TRACTORS & EXCAVATORS

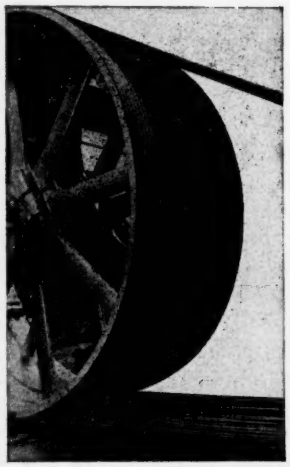
Ransome & Rapier Model 462 Excavator, 1947 machine. Recently overhauled. Fitted with 60ft. lattice jib and 1 cube yard drag line bucket. Driven by 5 cylinder MaLaren diesel engine with petrol engine starter.

H.D.14 Allis Chalmers Tractor with Garwood double drum power control unit. In good order as lying.

PNEUMATIC TOOLS

C.P.4 high lift sump pumps with delivery hose.
Pile driver attachments for Ingersoll-Rand breakers.
Rock drills, concrete breakers, rivet hammers, circular and chain saws.
Send for current stock list and prices.

WIGGLESWORTHS
for POWER TRANSMISSION EQUIPMENT



Makers of
"TEXROPE"
V
DRIVES

PROVED BEST BY TEST

FRANK WIGGLESWORTH & CO. LTD.
ENGINEERS
SHIPLEY YORKSHIRE

Laying the foundations of a new industry

FOR THE LAST TWO AND A HALF YEARS, the Fowler Challenger Crawler Tractor has been laying foundations. Foundation-laying includes shifting earth, shale and rock, and this rugged, diesel-powered Challenger moves them with unrivalled efficiency and dispatch. It is already proving this in 27 different countries.

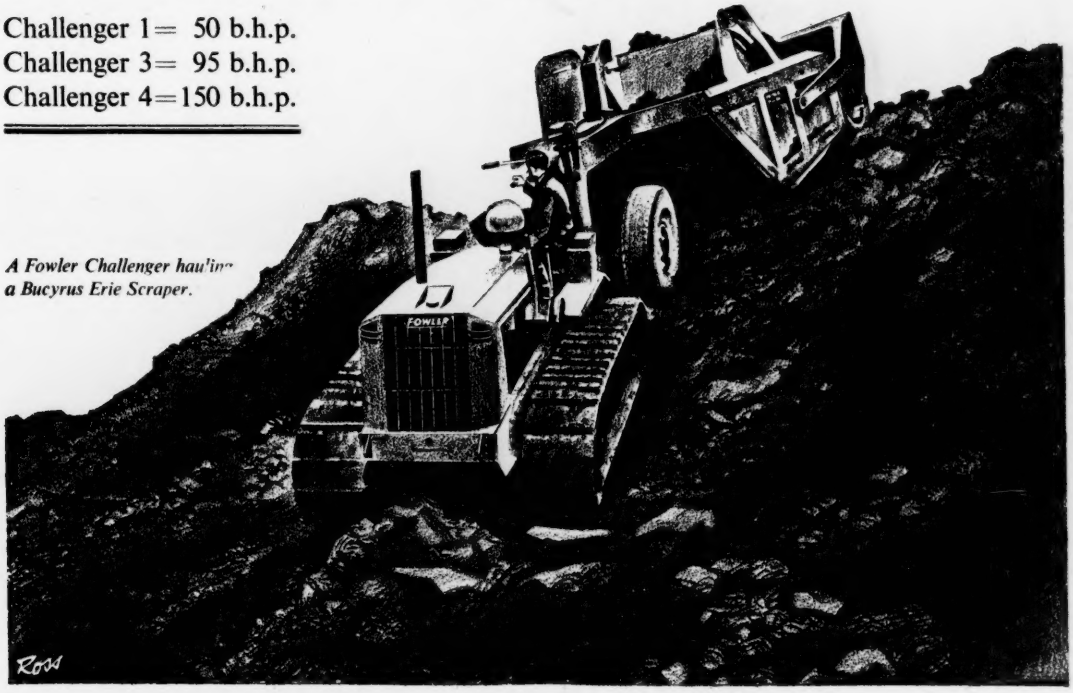
But the Challenger—the first all-British heavy-duty crawler—is a layer of foundations in more than one sense. It is one of a series of Fowler Crawlers, ranging in size from 50 to 150 horse power, which is already in production. Thus the skill and experience of one of Britain's oldest and most experienced engineering enterprises, in laying foundations all over the world, is building up a new industry in Britain.

FOWLER LEEDS **Challenger British Diesel Crawlers**

Products of the Marshall Organisation, Gainsborough, England

SOLE CONCESSIONAIRES FOR GREAT BRITAIN: THOS. W. WARD LTD., ALBION WORKS, SHEFFIELD 4

Challenger 1= 50 b.h.p.
Challenger 3= 95 b.h.p.
Challenger 4=150 b.h.p.



A Fowler Challenger hauling a Bucyrus Erie Scraper.

Tapping steel from an electric furnace; Kayser Ellison & Co. Ltd., Sheffield

You may not be a steelmaker, but...

.... YOU PROBABLY USE STEEL. Electricity has led to the production of better quality steels, and its use for heat treatment of those same steels has led to a better product again. In almost every heating process, in fact, electricity brings better results.

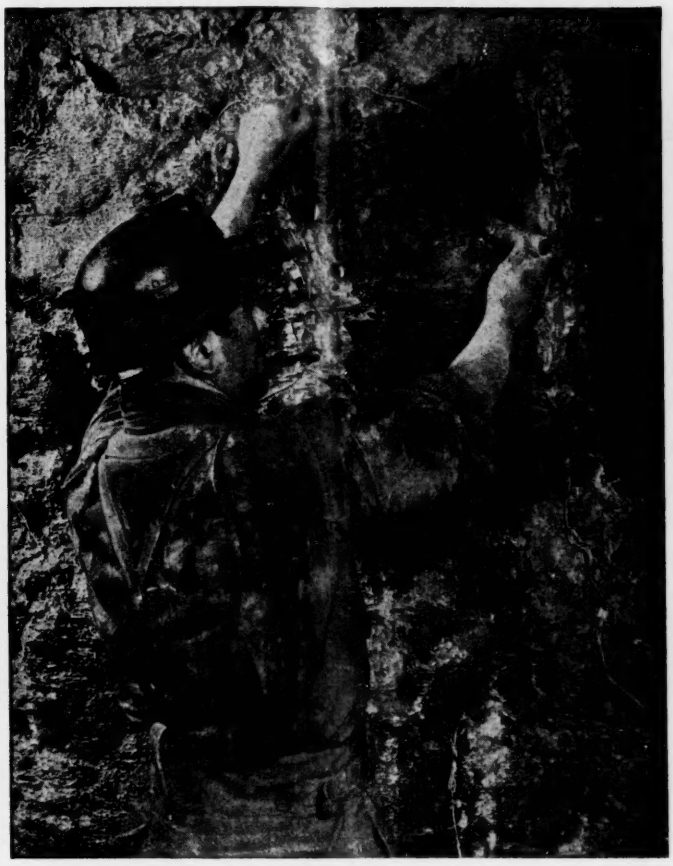
HOW TO GET MORE INFORMATION

Your Electricity Board will be glad to advise you on how to use electricity to greater advantage — to save time, money, and materials.

The new Electricity and Productivity series of books includes one on heating — "Electric Resistance Heating". Copies can be obtained, price 9/- post free, from E.D.A., 2 Savoy Hill, London, W.C.2, or from your Area Electricity Board.

Electricity for PRODUCTIVITY

Issued by the British Electrical Development Association



'NOBEL-GLASGOW' Explosives and Accessories

There is 'a 'Nobel-Glasgow' explosive for every blasting operation.

Users are invited to apply to the Nobel Division of Imperial Chemical Industries Limited for assistance with their problems.

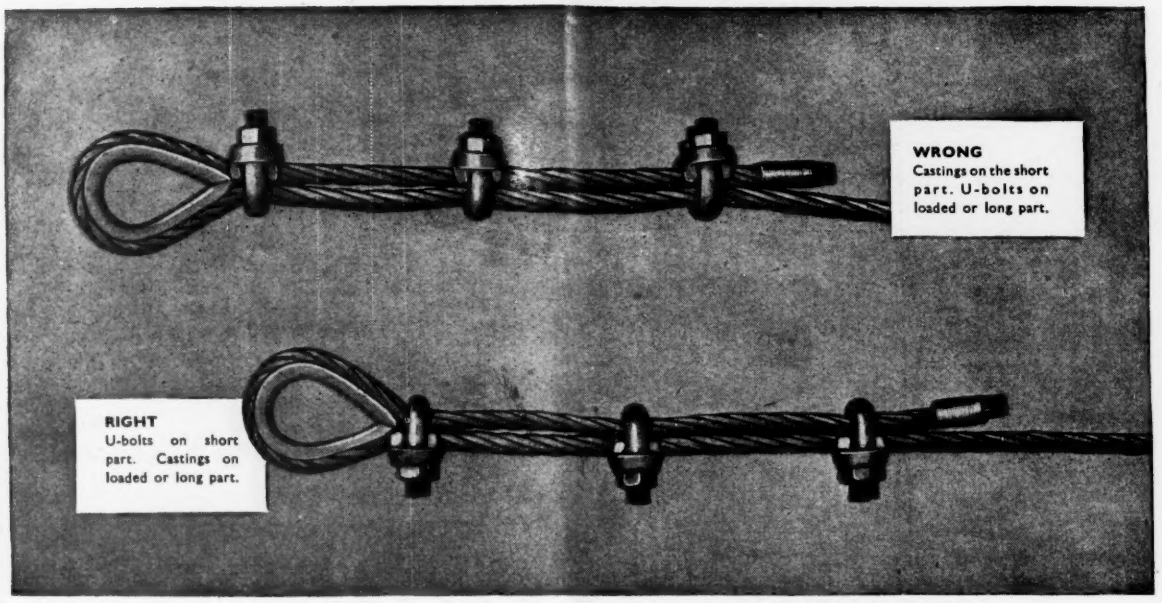
IMPERIAL CHEMICAL INDUSTRIES LIMITED
NOBEL DIVISION, 25 BOTHWELL STREET, GLASGOW, C.2

ICI

N.44

IF ROPE COULD TALK . . .

"I think I'm losing my grip"



The use of Bulldog clips provides a time-saving and effective alternative to splicing. Properly applied, these clips ensure a fitting which is approximately 90% as strong as the rope. But wrong application can make the fitting considerably weaker. For the best results, fit all the clips the same way round, with the casting on the loaded or long part of the rope, and the U-bolt on the short part. On any wire rope there should be a minimum of three Bull Dog Grips, ranging up to as many as eight on large ropes.

BUT REMEMBER! Screw the nuts up tight. Sometimes they work loose—check them from time to time and use the spanner as necessary

Write for a copy of a new booklet "If Rope could Talk".

British Ropes Limited

HEAD OFFICE: DONCASTER. EXPORT SALES OFFICE: 52 HIGH HOLBORN, LONDON, W.C.1.

The Mining Journal

Established 1835

Vol. CCXLI No. 6156 **LONDON, AUGUST 14, 1953** **Price 8d.**

CONTENTS

Notes and Comments	187	**The Mining Markets**	198
A General Survey of Russian Mineral Resources	189	**Company News and Views**	199
From our Portuguese Correspondent	190	Rand and O.F.S. Returns for July; G.C. Selection Trust Group June Quarterly Results; West African Gold Returns in July; "Indians" Better Results.	
Pollution of Streams by Mine Waters	191		
High Speed Drivage in Coal	193	**Company Shorts**	200
Correspondence	194	**Company Meetings**	200
Machinery and Equipment	195	Pengkalen Ltd.	
Metals, Minerals and Alloys	196		

Published by The Mining Journal Ltd., at 15 Wilson Street, Moorgate, London, E.C.2. MONarch 2567 Subscription £2 per annum

NOTES AND COMMENTS

Mr. Malenkov's Pronunciamento

The prolonged and impressive speech of Mr. Malenkov to the Supreme Soviet in Moscow at the week-end will be diversely interpreted according to the political and economic predilections of national communities and of individuals. When taken in conjunction with the inflammatory conditions in so many parts of the world, it seems to us to leave the international situation as equivocal as ever.

It seems to fall more or less into two sections, internal and external. In the internal section there is a promise to the citizens of the United Soviet Socialist Republics of progressive betterment in conditions founded on immense expansion of the heavy industries, the success of which now enables increasing consideration to be given to the necessities and desires of the proletarian population. In our own department of industrial activities, we are told that Soviet production in the current year would exceed 38,000,000 tons of steel, 320,000,000 tons of coal, 52,000,000 tons of oil, and 133,000,000,000 kWh. of electricity. This is, perhaps, some improvement from the point of view of factual disclosures, on the older system of claiming that each year showed a percentual improvement on its predecessor. With Russia's enormous natural resources and concentration on the development of heavy industries immense advances over the figures of 1940, taken generally as a basis, can hardly fail to be made, but we have no means of checking the actual claim advanced. It is admitted that there are many enterprises still running at a loss, especially the coal mining and the timber industry, but this is no monopoly of the Soviet State; our own coal industry offers some parallel. How costs are compiled we have no means of judging, but there can be little doubt that slave labour is not an unimportant contributor in the estimation of costs.

If the outside world remains somewhat sceptical of the economic success of Soviet industry in various departments it is due largely to the long existing policy of secrecy in regard to working conditions in that country and its satellites. No reasonable person looks for any economic collapse in the Soviet set-up; where opinions would probable differ, is in the estimate formed of how far the presentation and promise of improvement for the individual consumer and wage earner represents a fundamental amelioration of the previous struggle, promising a situation in which the conditions of life can be made more tolerable for the individual worker, and how far it is a forced concession to growing industrial discontent and exhaustion, the strain of which may be more than can be permanently sustained.

It is, however, to the external aspects of future Soviet foreign policy that foreign interest will be mainly directed. Here, in spite of repeated declarations of a consistent pursuit of "peaceful aims," Mr. Malenkov's speech offers the least reassurance when contrasted with the international situation as it presents itself to their minds. "The Soviet Union," we are told in the version of the speech which has been published here, "is a mighty Socialist Power, full of creative forces, and is successfully advancing along the road of creating a Communist society." This sounds very like a reaffirmation of the long proclaimed Soviet objective of world domination, and an intimation that it would be optimistic to expect much from international conferences on the lines conceived by President Eisenhower in projected meetings either in the United Nations or any *ad hoc* discussions. Mr. Malenkov and the Praesidium seek the dissolution of the North Atlantic *bloc*, "the main threat to the cause of peace," and will continue to help and support the "German Democratic Republic." France and Japan are urged to assert their national independence, while the "glorious Italian people" can expect considerable support as soon as mutual obligations are carried out. Also "glorious" in Soviet estimations are the Chinese people's volunteers who, like Mussolini and Hitler in Spain, came to the aid of the equally "glorious" Korean people—the political hagiology tends to become a little monotonous. Relations with India and Afghanistan are consolidating and with Egypt, Israel and the Arab States improving—all of course within the sphere of the "democratic camp." The international organization, the United Nations, is described as being in a "state of profound crisis." Good neighbourly relations with Turkey could develop if the "essential prerequisites" set out in the recent note to Turkey are fulfilled. Yugoslavia does not figure in Mr. Malenkov's review. Great Britain's position is dismissed with the assurance that "wide public demands to ease the international situation" have been growing, while as regards the United States the policy of its Governing circles "is in irreconcilable contradiction to the statements of President Eisenhower in his speech of April 16."

As regards the trade policy of the U.S.S.R. the line of developing "exchange of goods" with foreign States will be pursued with insistence, and trade agreements have been concluded with France, Finland, Persia, Denmark, Greece,

Norway, Sweden, the Argentine, Iceland and Egypt, and are proceeding successfully with a number of other States.

Such then is the general content of the perspective of the new Soviet regime's programme as set forth in the version of Mr. Malenkov's speech which has been published in this country. In so wordy an oration varying emphasis will doubtless be given to this or that portion according to individual standpoints, but for ourselves it does not seem to augur too favourably for the success of the projected international conversations.

Asbestos Producers' Markets Weakening in S. Rhodesia

Small and medium sized asbestos producers in the Belingwe district of S. Rhodesia are, according to a report from *The Rhodesia Herald,* experiencing serious difficulties in marketing their fibre. Several producers have made no sales at all during the past two months, and accordingly it is feared asbestos production in this area may soon have to be drastically reduced or even cease altogether.

Should this eventuate the impact on the local Belingwe economy would be indeed serious for it would deprive the area of the benefit of at least £150,000 per annum, which figure is given as the estimated combined local spending power of only four of the producers in the district.

Although the local producers were well aware that the world demand for asbestos had fallen, it was salutary to find that the producers, in the light of this fact, did not resign themselves to a period of waiting until the market demand revived but turned their attention to analysing the quality of the product which they had been offering to the market. The ensuing investigation revealed that on two points at least their product did not conform to the highest standards. It was pointed out that there had been numerous occasions in the past when fibres had been placed on the market containing an excessive amount of grit and dust, and secondly, that the grading of Rhodesian fibres had not, in many cases, been uniform. Another contributory cause to the present predicament was thought to be the lack of any selling organization to market the product of the smaller producer whose contacts with the markets were woefully inadequate, and in the majority of cases non-existent.

To remedy the situation a meeting was subsequently held attended by the small producers throughout S. Rhodesia with Mr. G. A. Davenport, Minister of Mines and Transport, at Bulawayo on July 30 last.

The leading questions asked of the Minister were whether world demand had fallen away; whether S. Rhodesia was marketing an inferior product at too prohibitive a price; and finally, whether other sources of supply had become available to the world market. Mr. Davenport replied that while he had hoped to learn the answers to these questions from the meeting, he did think that the situation might be eased somewhat by an elimination of "middleman" activities. On the question of the fall in world demand, he said that he had heard that one explanation was over-production of asbestos from Canadian sources.

At the meeting it was decided to appoint a committee of six producers to examine the suggestions made as to how best the market might be restored. Since there is a strong feeling in the Belingwe district that a selling organization to market the products of the small and medium producers should be established by the S. Rhodesian Government—but financed by the producers—there is no doubt that more will be heard on this matter.

Belingwe is included in the Bulawayo area in so far as survey statistics are concerned, and some indication of its standing as an asbestos producing area may be gathered from the fact that of the 84,834 s.tons produced by S. Rhodesia in 1952, no less than 59,532 s.tons were produced in the Bulawayo area. Other asbestos producing districts returned the following output figures for 1952: Victoria 24,353 s.tons, Gwanda 521 s.tons, Salisbury 316 s.tons, and Gwello 113 s.tons.

Tax Relief for Mexican Mining Companies

Under a decree published in Mexico on July 31 last and effective the same day, small mining companies will get an estimated 24,000,000 pesos in taxation relief.

This tax relief, which applies only to primary producers, is in the form of a subsidy calculated on the basis of total production, export and supplementary taxes, with an initial maximum of 75 per cent of all taxes due. The subsidy will diminish progressively and will not, says Reuter, be applicable to tax bills exceeding 200,000 pesos annually.

The chief objectives which the Mexican Government hopes to achieve by this measure are first, the working of mineral deposits which under the existing system of taxation were considered as uneconomic propositions by both large corporations and small companies and, secondly, the stimulation of investment of Mexican capital.

An improvement over the former taxation system as it affected Mexican mines was foreshadowed in an article from a Mexican correspondent, which appeared in our issue of February 13 last on page 185. At that time our correspondent pointed out that the then new Mexican Government headed by President Ruiz Cortines would not seek foreign loans during its period of office, and would map out a development policy designed to yield a better return on investments, and to increase efforts to apply Mexico's resources to improve the country's standard of living. With regard to the matter of foreign loans the article pointed out that no opposition existed and that foreign capital would be particularly welcome if it were utilized to establish trade, improve the means of production, and increase the numbers of Mexican skilled and semi-skilled workers.

The new measure of tax relief must have come as welcome news to the Mining Chamber of Mexico, which had been agitating for years to secure for the mining industry a more equitable taxation arrangement. Whether or not this measure of taxation relief will be considered sufficient to attract British capital investment in Mexico's mining industry remains to be seen. In this connection it may be recalled that at the beginning of the year a British mission led by Brigadier General W. H. Crosland had been holding talks with Federal and financial officials of the Mexican Government and had received assurances that Mexico was interested in having United Kingdom business men invest in new enterprises "subject to national laws" as well as increased imports of industrial equipment.

N.C.B. to Establish a Central Engineering Establishment

The National Coal Board, as mentioned in their report for the year 1952, have decided to set up a Central Engineering Establishment which will have two main functions—the development of new machinery and equipment, and the testing of machinery, ropes, and new materials.

With regard to development work carried out by the proposed establishment, the N.C.B. has announced that it is intended primarily to act as a link between the Board's Research Organization and the manufacturers of mining machinery and equipment. In this way it will serve to supplement the development work, which is, and always has been, a function of those manufacturers serving the coal industry.

The testing work will be concerned with special tests of machinery, ropes, etc., and also with the development of improved methods for the routine testing of equipment and materials used in mining.

While no definite place for the construction of the proposed establishment has been made, the N.C.B. are currently considering a site in Derbyshire.

RUSSIA'S MINERAL RESOURCES—I

A General Survey of Russian Mineral Resources

The accuracy of world metal statistics has long been vitiated by lack of reliable information about Russian and satellite output and requirements and in some cases by a total absence of information. In the circumstances an event of some importance is the appearance of Professor Shimkin's book on "Minerals—a key to Soviet power," published by the Harvard University Press (London: Geoffrey Cumberlege) at 52s. net. This work is one of a series of studies prepared by the Russian Research Centre at Harvard. Broadly speaking we are left with a picture of Russian self-sufficiency in respect of the ferrous metals and non-metallics and of deficiency in the non-ferrous metals. Allowing for the inevitable margin of error which must exist in these calculations they offer an interesting comparison with the findings of the Paley Report as regards the position of the Free World. Despite the tremendous mining expansion in Russia during the past 25 years (culminating during and since World War II in a considerable shift eastwards in the mining and metallurgical industries and in a marked advance in mining and refining techniques), Professor Shimkin suggests that Russia's untapped potential still remains very great, on the one hand in terms of unexplored or imperfectly explored areas of likely mineral wealth and on the other in terms both of the low level of efficiency of mineral recovery which still obtains despite recent technological advances and of the low purities obtained from many refining processes. In the article which follows we give some of the broad conclusions to which Professor Shimkin points while in a later issue we shall summarize his findings regarding Russia's statistical position for some of the more important metals.

The Russian Research Centre at Harvard University was established on February 1, 1948. It is supported by the Carnegie Corporation on a grant covering the period until July 1, 1958, and has for its major objective the study of Russian institutions and behaviour in an effort to promote a better understanding of the international actions and policy of the U.S.S.R.

A USEFUL APPRAISAL

For many years the Soviet Union has been represented in tables of world mineral statistics by blanks or by round figures conspicuously labelled "estimates," which might more accurately be described as "guesstimates." Of considerable interest, therefore, is the Centre's systematic survey of the mineral resources, production and consumption picture of the U.S.S.R. Because of Russia's policy of extreme secretiveness, the blanks in the mineral statistics cannot be reliably filled up. Apart from information which continues to be withheld, Soviet metal economics is complicated by the confusing treatment of such statistics as are disclosed to the public (which are usually given as percentages of certain bases and goals, often readjusted) and by the Russian tendency to exaggerate. Professor Shimkin acknowledges that his study can only be considered as a working model and that a more reliable treatment is a matter for the future. Bearing in mind these limitations, his book can be accepted as a useful appraisal of Soviet metals and resources in the light of available knowledge. Since the strength and prosperity of the Soviet Union and her satellites depends largely on the production and utilization of minerals and metals, it is desirable that the pattern of mining and technological development should be pieced together as accurately as possible from the data available.

RELIABILITY OF INFORMATION

It is particularly instructive to compare U.S.S.R. "hypothetical standard" requirements for 1950 with the estimates given in the Paley Report for the free world's production and consumption for 1975. Making due allowance for the inadequate data on which Shimkin's "hypothetical standard" is frequently constructed, the comparison gives an illuminating indication of the relative strength and weakness in mineral resources of the free world and the Soviet Union.

Particularly interesting is Shimkin's evaluation of the reliability of available information. It is believed that, in general, statistical data can be divided into four orders of approximate reliability. Reliable materials with a likely error of, say, 5 per cent, appear to include Soviet production statistics for 1926-1938; foreign trade statistics for the U.S.S.R. 1926-1944; all mineral output and consumption statistics for the United States; and the locations of Soviet mineral deposits. Fairly reliable materials, with a likely error of up to 10 per cent, seem to comprise estimates of Soviet mineral output since 1939 (where based on specific statements of percentage increases); estimates of over-all mineral consumption in the U.S.S.R.; statistics on recovery levels in Soviet mining and ore dressing; official statistics on Soviet mineral reserves; and, in part, data on the mineral output of the Soviet satellites. Materials of low reliability, with a likely error of up to 20 per cent, include estimates of consumption by individual minerals from 1944 onwards; unofficial estimates of mineral production and reserves; and part of the data on satellite mineral output. Finally, certain data utilized by Shimkin represent calculations from theoretical assumptions. These include the derivations of Soviet and satellite Hypothetical Standard mineral requirements under peace and war conditions in 1950; the rate of Soviet and satellite economic growth to 1970; and the consequent Hypothetical Standard reserve requirements to ensure self-sufficiency throughout the period 1950-1970.

LOW RECOVERY LEVELS

In dealing with Soviet mineral production statistics, special care must be exercised in regard to discrepancies in official figures, ambiguities in commodity definitions, differences in units of measurement, incompleteness of coverage, and uncertainties of base figures for data presented only as annual percentages of increase. In addition, the peculiarities of Soviet technology make the estimation of output from plant capacity information extremely uncertain. Yet another factor of great significance in evaluating Soviet mineral reserves is the low recovery levels achieved in mining and smelting, which appreciably shorten the lives of many deposits and exclude the ores from others from practical consideration.

In general, the mineral wealth of the Soviet Union, as at present known or inferred, approximates that of the United States. Both countries have enormous reserves of coal and lignite, magnesium salts, and a series of non-metallic minerals: bromine, fire clay, gypsum, phosphate rock, and low-grade sulphur basics. The known copper reserves are approximately equal, while neither has measurable resources of diamonds. Soviet reserves are much greater than those of the continental United States and Alaska for antimony, asbestos, possibly china clay, chromite, amorphous graphite, magnesite, manganese ore, mercury, mica, nickel, possibly petroleum, platinum, potash, natural

sodium salts, and tin. On the other hand, the American potentials considerably exceed those known for the U.S.S.R. in bauxite, borax, cadmium, cobalt, fluorspar, helium, iron ore, lead, dolomite, molybdenum, natural gas, titanium, tungsten, vanadium and zinc.

Despite serious setbacks caused by losses during World War II, Russia's mining industries have undergone tremendous expansion during the past quarter of a century. Furthermore, the last decade has witnessed a pronounced eastward shift in production, and considerable maturation in mining and refining technology. Nevertheless, the Soviets have been unable to meet their own ambitious goals, intended to permit a breakneck pace of industrialization and economic expansion. The chronic shortage of minerals resulting from this failure has had numerous consequences. The U.S.S.R. has shifted from a net mineral-exporting to a mineral-importing balance of foreign trade. It has sacrificed healthy economic expansion to the overriding needs of heavy manufacturing. It has accepted serious waste from the widespread use of substitutes. In its search for military security it has also striven to achieve self-sufficiency, through the development of domestic production and through assiduous stockpiling. These efforts have only been partially successful.

CONSIDERABLE KNOWN MINERAL RESERVES

The known mineral reserves of the Soviet Union are extremely large. In most ferrous metals and non-metallics, and in fuel, they are abundant or adequate to permit self-sufficiency for 20 years or more of intensive economic development. On the other hand, the reserves of most non-ferrous metals and other minerals such as diamonds and tungsten range from doubtful adequacy to negligible size. Shimkin emphasizes, however, that the situation as at present known reflects primarily the pioneering stage of Soviet prospecting and mining development. Even the preliminary geological reconnaissance that sums up present knowledge of most of the Soviet Union has brought out, beyond question, the great structural diversity and virtually limitless ultimate potentialities of Russia's lands. The wealth of the Urals may well be duplicated in Turkestan and central Siberia.

A final aspect of the rapid increases in Soviet mineral production over the past 25 years has been considerable progress in mining and refining technology. During and since World War II many technological difficulties were overcome, in substantial part, because of the great material and technical assistance provided by the U.S. and the British Commonwealth. Greater experience and improvements in flow sheets, such as the wider use of coal-washing and iron-ore agglomeration units, have raised recoveries and standards—notably for antimony, asbestos and graphite. The recoveries of by-products, especially cobalt and molybdenum, and the use of very low-grade ores—e.g. tin—are now moderately successful. A contributing factor has been the establishment of a central rare-metals refining plant at Chelyabinsk, modelled on an American prototype. The degree to which the Soviets are using advanced American and German methods, notably heavy media separation, is uncertain.

PRIMITIVE TECHNIQUES IN MINING AND REFINING

Despite impressive progress, the Soviet Union still lags appreciably in mining and refining technology. Primitive techniques, as in sodium sulphate mining, and primitive equipment are still evident. Low purities characterize much of Soviet metal production. The range of ferroalloys in standard production is both limited and conventional. Geochemical and gravimetric prospecting methods are advanced, but electromagnetic methods and experimental seismology appear to be immature.

Shimkin concludes by reiterating that the wide occurrence of highly diversified geological formations is so favourable to new discoveries that in many instances existing deficiencies are likely to be transitory. The Kazakhstan Uplands, the Western Sayan Ranges, and the Angara-Yenisei Sub-system appear to be extremely promising, particularly for discoveries of ferrous metals. At the same time, it is evident that the extreme poverty of the western frontier of European Russia, in terms of known mineral deposits, reflects inadequate exploration as well as adverse natural conditions.

Portugal

(From Our Own Correspondent)

Oporto, July 22.

The strong efforts now being made to obtain complex columbite-tantalite ore has caused a minor revival of the tungsten rush. Those few exporters who have any of this material to offer have long since made their arrangements direct with the parties immediately concerned, but it is amusing to peruse the shoals of correspondence received by Oporto exporters from the most unlikely and often most undesirable people in Lisbon. It is curious to observe that all these attractive proposals come from Lisbon; none from Oporto.

CALCULATING THE TAX

The new method of calculating the export tax on tungsten ores contains the usual anomalies common to fiscal efforts to obtain the utmost possible without quite knowing how. Here is an example, as your correspondent figures it :

The tax on " residues " has not been altered, so material going up to 25 per cent WO_3 pays Esc.16 per kilo. But if material showing say 40 per cent WO_3 be exported, the tax would be Esc.3.60. To this must be added Esc.4 for export duty, making a total of Esc.7.60. This is how the calculation works out. One s.ton of low-grade concentrate going 40 per cent WO_3 worth $30 per s.ton unit f.o.b. works out at $1,200 per s.ton. $1,200 at Esc.28.60 per dollar equals Esc.34,220 per s.ton, or Esc.37.72 per kilo. This figure, however, must be taken as Esc.38 since the per kilo price must be a round number. The new formula provides that from the per kilo price sold to the consumer Esc.30 must be deducted and the result multiplied by 0.45. Esc.38 less Esc.30 leaves Esc.8. This multiplied by 0.45 gives us Esc.3.60 which is the export *tax*. To this must be added Esc.4 export *duty* making a total payment of Esc.7.60. Thus material going 25 per cent or less, i.e. " residues," pays Esc.16, while 40 per cent material pays Esc.7.60 per kilo. Material better than 25 per cent WO_3 is held to be a concentrate and according to present formula benefits accordingly.

If rumour is to be believed, the so called " Tin Scandal " has settled itself automatically. After publishing as much as the censor allowed to be made public property, the local press suddenly ceased to refer to the matter which had caused more than a little talk both here and elsewhere. This development seems to support the rumour circulating to the effect that the central figures in this drama have removed themselves and their profits, which would seem to have been considerable, to surroundings where extradition cannot touch them. They were imprisoned for 45 days preventive detention ; and then released, though whether on bail or not is not clear. Meanwhile the crew and owner of the ship which was sunk are still to be tried.

Pollution of Streams by Mine Waters

The Rivers (Prevention of Pollution) Act of 1951 makes it an offence to place objectionable matter in a river, while the Rivers Board Act promotes the anticipation that the discharge of offensive matter into rivers will be brought under increasingly strict control in England and Wales. At the same time, the pollution of rivers and streams has become a problem in some Dominions and Colonies. The following article traces the sources of stream pollution from mine workings and refers to some remedial measures adopted in various parts of the world.

Latterly growing concern has been felt in East Africa over problems of water pollution. Dr. B. A. Southgate, Director of the Water Pollution Research Laboratory, visited Uganda recently at the invitation of the Government to study the pollution position in that territory, and to recommend measures for prevention and control. The Owen Falls scheme, by attracting industries to the river's bank, may have harmful effects on the fisheries, to which the Government attaches particular importance because fish are an important source of protein in parts of the territory. It is necessary, therefore, to ensure that no polluting matter, such as copper-containing effluents from mining operations on Ruwenzori, will find their way into the lakes. Changes have been made in the law in order to give the Government power to control pollution, and at Dr. Southgate's suggestion a Pollution Officer for the territory has been appointed.

AN INTERNATIONAL PROBLEM

Scientific research in many countries is throwing new light on the effects of pollution and is contributing to the development of more efficient methods of treatment.

During the past 50 years pollution problems in Cardiganshire rivers have been the subject of investigation from a number of aspects. Lead and zinc mining in Cardiganshire began in prehistoric times and has continued intermittently until the present day. The area affected comprises the main watershed of the drainage system of Wales. A number of mines were opened in the time of Queen Elizabeth after the formation of the "Society for the Mines Royal," which was founded in 1568. In 1690 and the succeeding years, additional workings took place, and by 1747 there were records of the deleterious effects of the mines on live-stock. There followed a long period during which the industry declined, and between 1872 and 1922 a large number of mines closed down, though there was a recrudescence during the war period.

The degree of pollution caused by lead mining has varied with the mode of treatment of the ore. The introduction of the Cornish method by which the ore was crushed led to the formation of slime-pits which were very rich in lead and zinc. It has been shown that water passing from these pits was especially deleterious to the fauna and flora of the rivers.

Scientific work on the pollution of Welsh rivers by lead and zinc mine effluent has been summarized by Professor Lily Newton, M.Sc., Ph.D., F.L.S.[1] Knowledge of the effects of lead and zinc on plant and animal life has been greatly increased, and certain conclusions have been reached.

The gradual weathering of the surface of old dumps and slime-pits causes an oxidation of galena to lead sulphate, and blende to zinc sulphate. These are more soluble salts, and are subsequently dissolved by surface water and carried into the river. It has been demonstrated that the presence of zinc is as serious a source of pollution as the presence of lead, and that in the case of plants zinc is even more deleterious than lead. When plants are grown in the presence of from 1 to 10 parts in 1,000,000 of zinc, the toxicity increases sharply with the concentration. Since the amount of lead present in the soil-water of the dumps and in the rivers is unlikely to be greater than 3 parts in 1,000,000 for chemical reasons, the greater toxicity of zinc is one of the primary causes of the paucity of vegetation on the mine detritus and in the rivers. The coarser material, which partly comprises the dumps, is hard and weathers very slowly thus lacking the necessary potentiality for supporting vegetation. Another cause of the lack of colonization by certain plants is the effect of the blown material from old slime-pits, which accumulates round the vegetation.

The presence of detritus from the mines, thickly covering the river beds, is a mechanical deterrent to the establishment of certain vegetation. It has been established that the cause of the death of fish is not the presence of fragments of galena grit causing clogging and inflammation of the gills, but the formation of an adsorption complex of the heavy metals on the gills, together with an excess secretion of mucus, causing acute respiratory distress and suffocation.

Settling pits do not obviate pollution, because their use cannot entirely prevent a solution greater than 1/10,000,000 of lead and 3/10,000,000 of zinc from reaching the rivers. Such solutions are toxic to certain fish. Where galena and blende are mined, precipitation of suspended matter should be provided for. This must be followed by passing the effluent through a peat-filter to remove the colloids.

The river Rheidol is an interesting example of a river which has now recovered from lead pollution. In 1919, when Carpenter began her study of this river,[2] the lead mining industry of Cardiganshire was in its final stages of decline, but the river was still heavily polluted. Recovery began in 1922, after all lead-mining operations in the valley had come to an end. In 1947, a further ecological study was made by Erichsen Jones, who concluded that the river could be regarded as completely recovered.[3]

Most metals are extremely poisonous to fish, but the degree of toxicity depends on the hardness of the water. The harder the water, the higher the proportion of a toxic metal which can be tolerated. In studying conditions in Welsh rivers, the investigators were dealing with very soft waters, in which the polluting metals were particularly toxic. Their observations have nevertheless shown very clearly that in any country where fishing is important, the amount of waste from the treatment of ores which can safely be discharged into streams is very small.

THE CHIEF DANGER

The chief danger of pollution from metal mining is that the metals contained in dumps or slime dams might be leached out by rainfall or discharged through the bursting of the dam. Many problems require to be studied before firm conclusions can be reached. In Uganda, for instance, the amount of copper issuing from slimes dams will have to be measured; if it is unduly high the water will have to be passed through a treatment tank for purification, possibly by cementation with iron.

So far no commercial method for treating the drainage from dumps and slimes dams has been developed. One of the chief problems is to deliver the effluent to a single point for treatment, and another complicating factor is the variable flow from mountain streams. Interception channels may have to be provided on bare hillsides to stop the rainwater from running through the dump, and the dam walls should obviously be strong enough mechanically to stand up under all conditions. Thus the prevention of pollution will be a matter of engineering as well as chemical treatment.

There are two types of polluting liquors which may be discharged from collieries, namely waste waters from the washing of coal and waters pumped or flowing from underground workings. (Effluents from coking plants are outside the scope of this article.)

COAL EFFLUENTS

In 1874, the Rivers Pollution Commission reported that severe pollution of rivers was being caused in several parts of Great Britain by waste waters from the washing of coal, a process which had been introduced during the preceding ten years. By 1915, when the Royal Commission on Sewage Disposal issued a report, settling tanks had been constructed at many collieries for the treatment of coal-washing waters, which in some cases were then re-used in the washing process. Since that date, the advances which have been made in coal-burning equipment (necessitating the more careful grading and control of ash content in coal), the use of low-grade slurries as fuel in boilers, and the measures which have been taken to safeguard the purity of surface waters, have led to the installation of washeries of modern design at many collieries, with a consequent reduction in the pollution of surface waters.[4]

A report by the West Riding of Yorkshire Rivers Board[5] deals with 105 collieries, and at 79 of these coal washers were in operation. The prevention of pollution by coal washing water does not present any serious scientific or technical difficulties, as effective settlement of the discharges generally produces an effluent fit for the stream. The quantity of sediment produced, however, is so large that the most careful attention has to be given to keeping the settling tanks clean and effective.

In a few cases, it may be difficult to produce a well-clarified effluent by simple settlement, but resort to some flocculating and precipitating reagent is then generally sufficient to do all that is required. In some modern plants for the flocculation and clarification of coal washing waters, the effluents are of such high quality that they are usually returned to the washer, and there is seldom any discharge to the stream. This, of course, is the ideal, and nowadays it can usually be achieved. With a modern well-designed washer it should be possible to prevent pollution from the outset, and to recover slurry in a usable condition as well as producing an effluent fit for re-use.

LEGALITIES REGARDING POLLUTION

In Britain the legal position regarding pollution by mine drainage differs from that of pollution by wastes from manufacturing processes. In the Rivers Pollution Prevention Act, 1876, which made it an offence to pollute streams by sewage and trade wastes, an exception was made for water drained or raised from a mine, if discharged in the same condition as when raised or drained. Such water was again excluded in the Act of 1951, but in this case a saving clause was inserted which enables the Minister by Statutory Order to direct that the sub-section in question shall not apply to the discharge into a particular stream or part of a stream.

In some collieries the water pumped from the mines is comparatively pure and is used as a domestic supply. In others, it contains ferrous and ferric compounds, and it may contain free sulphuric acid. A mine water may contain sufficient sulphuric acid to render acidic the water of a stream to which it is discharged. As the acidity becomes neutralized by the natural alkalinity of the stream, iron hydroxide is precipitated, giving the water that characteristically rusty appearance known as " ochre water," which is found in a number of British streams.

Mine waters cause very little trouble in Britain, but severe pollution occurs in some American mining districts, probably because some American coals contain relatively high proportions of sulphur and because a large proportion of the coal in these districts is obtained from shallow " drift " and " slope " mines, from which the volume of acidic, ferruginous waters is usually higher than from deep shaft mines. It has been estimated that, until remedial measures were taken, mine waters draining into the Ohio River and its tributaries contained acid equivalent to over 3,000,000 tons of sulphuric acid per year, resulting in damage and expenses which amounted to some $10,000,000 annually. A large part of this cost was incurred in treating the acidic river water for domestic and industrial use.

METHODS OF REDUCING THE EVIL

Methods which have been suggested or used for reducing pollution from acidic mine drainage in America include : (1) impounding the mine drainage, (2) flooding abandoned mines, (3) completely closing mines, (4) diluting mine drainage, (5) diverting acid wastes to already polluted streams, so as to prevent damage to other streams, (6) obstructing the entry of air into abandoned mines and into worked-out districts of active mines, (7) diverting surface waters to prevent their entry into mines, (8) neutralizing acidic drainage by addition of lime, limestone, soda ash, etc., and (9) treating acid drainage for recovery of valuable by-products.

Due to the high cost, neutralization or recovery of products has not been used on a large scale, but much has been done to remedy pollution by the sealing of openings through which air can enter the workings of abandoned mines or abandoned districts of active mines. The weight of acid (as H_2SO_4) discharged into the Ohio River was estimated at about 2,500,000 tons annually before the programme of sealing mines was begun. By 1944 the load had been reduced to about 1,800,000 tons annually, and it was calculated that it could be reduced ultimately to about 600,000 tons.

Another method which has been adopted in America consists in impounding the relatively alkaline river water above the coalfield and discharging it at times of low flow. This does not affect the total weight of acid discharged from mines, but it prevents the occurrence of very high concentrations of acid in the mixture of river water and mine drainage.

The West Riding of Yorkshire River Board refer to the increasing use of water softening processes by collieries which are compelled to rely on mine water for boiler-feed and other purposes. At many collieries there are now water-softening plants, mostly of the lime-soda type, resulting in the production of considerable quantities of limey sludge, which must be dealt with to prevent pollution. When water-softening is not adopted, it is customary to inject into the boilers a regular supply of some chemical reagent, which precipitates the scale-forming constituents of the water in the form of a finely divided sludge. It then becomes necessary to remove this sludge by blowing out part of the contents of the boiler pediodically. Since the discharge contains far too many suspended solids to be allowed to reach a stream, some efficient settlement must be provided.

Another example of pollution from mining wastes is to be found in the condition of some Cornish streams into which effluents from the quarrying of china clay have been discharged. Prevention is merely a matter of constructing settling lagoons in the hillsides, which presents no technical difficulties. At least one quarrying company adds alum to the water to assist sedimentation of the china clay.

REFERENCES

1. *Water Pollution Research, 1923-1943,* by Professor Lily Newton, M.Sc., Ph.D., F.L.S.
2. Carpenter, K. E. (1924), Ann. Appl. Biol. *11,* 1-23.
3. Jones, J. R. E., J. anim. Ecol., 1949, *18,* 67-88.
4. *Treatment and Disposal of Industrial Waste Waters,* by B. A. Southgate, Director of Water Pollution Research, D.S.I.R.
5. Report upon Trade Refuse (Coal Trade) in the West Riding, April, 1948.

High Speed Drivage in Coal

By A. GRIERSON, B.Sc., A.M.I.Min.E.

The design of cutting-loading machines suited for operations at the longwall faces of British collieries has long held the interest of manufacturers, and efforts in this direction have culminated in the introduction of several loading machines having the desired features. In the following article the Joy Continuous Miner, which was mentioned in our issue of July 13, 1951, and the Marietta Miner, a brief description of which appeared in our issue of April 3, 1953, are selected as indicative of the general features of this type of equipment. The units are presented as illustrating the potentialities of this system of machine mining.

The fact that most of Britain's coal output is won from longwall faces has naturally caused more attention to be paid in this country to the development of loading machinery for such faces, than to equipment suitable for application where alternative methods of working prevail. In the U.S.A. however, the longwall method of working is not used to any great extent, the favoured system being mechanized room and pillar working, this method being admirably suited to the thicker seams and immense coal reserves of America. In consequence of this prevailing system of mining great progress has been made in the U.S.A. in the development of machines designed to operate in relatively narrow headings or faces.

Such machines as the Joy Loader and Duckbill Loader originally developed in America have had universal application in mining, but have, however, the inherent disadvantage of being purely loading machines. This requires, of course, in coal mining, a pre-cut face and subsequent blasting. Despite the very efficient coal cutting machines developed for use in conjunction with such loading machines as the Joy and Duckbill, it was felt that a machine dispensing with the need for the external operations of cutting and blasting would be well received by mining engineers. Continued effort by mining machinery manufacturers with this aim in view culminated in the introduction of several loading machines having the desired features. Examples of such machines are the Joy Continuous Miner, the Marietta Miner, the Goodman Continuous Miner and the Lee Norse "Koalmaster." A brief description of the first two machines will serve to indicate the general features of this type of equipment, and illustrate the potentialities of this system of machine mining.

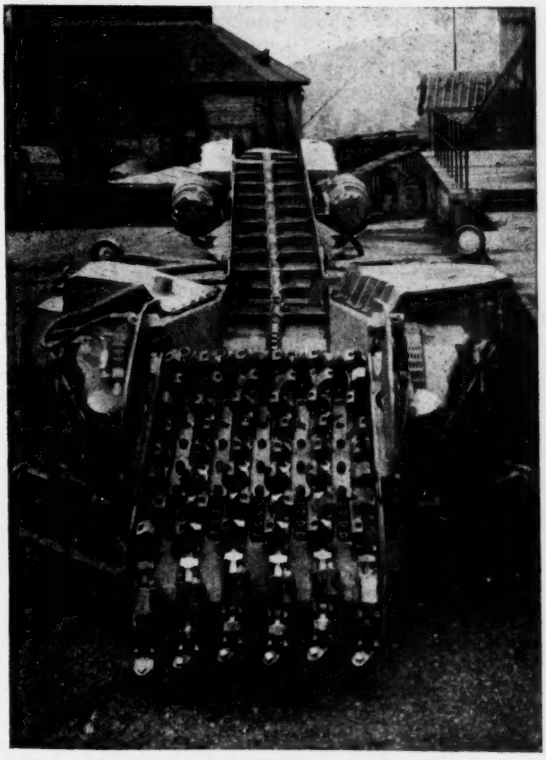
THE JOY CONTINUOUS MINER

The Joy Continuous Miner consists essentially of a ripping head, loading on to intermediate and rear chain conveyors mounted on a main framework carried on caterpillar tractors. This main frame also houses the power units. The ripping head consists of six cutting jibs mounted vertically side by side and driven from a common driving shaft having a 65 h.p. motor at each end. The ripping head and intermediate conveyor can be advanced or retracted 18 in. and may be slewed to make an angle of 45 deg. on either side of the centre line through the machine.

The ripping head is 30 in. wide and each of the chains carries 20 tungsten carbide tipped picks. In advance of each tractor and under the ripping head is a spiral gummer which picks up loose coal on the floor and delivers it to the intermediate chain conveyor immediately behind the ripping head. This intermediate conveyor loads on to a boom mounted rear conveyor which discharges into the transport medium following behind the Continuous Miner. As the loading boom is also capable of slewing 45 deg. in each direction it follows that the ripping head and delivery boom can be set to make an angle of 90 deg. with each other. This makes for increased loading manoeuvreability and facilitates the moving of the machine in confined spaces underground. This factor is of extreme importance where one machine is serving several headings.

In operation the Continuous Miner is advanced to the face along the centre of the heading with the ripping head fully retracted and at floor level. The cutting chains are then set in motion and the ripping head forced by a pair of hydraulic rams into the coal for the full 18 in. advance. Then a further pair of hydraulic jacks are operated to force the ripping chains upward towards the top of the seam. This cuts and bursts away the coal which is carried back by the picks chains and delivered on to the intermediate conveyor and thence via rear conveyor to the shuttle car or room conveyor. The ripping head is then slewed to take an adjacent strip of coal and the process is repeated across the width of the heading.

It will be apparent from the foregoing that there are two seam height limits of application. A minimum seam height governed by the structural height of the Continuous Miner and a maximum seam height governed by the height of the vertical arc of the ripping jibs. On one model seen in operation these limits were respectively 42 in. and 67 in., the machine being designed to cut and load two tons/min. Suitable structural alterations can be made to enable the Continuous Miner to operate in a seam thickness outside the standard range. As a single rip can be made in less than one minute it follows that an entire heading face can be quickly stripped and instances are on record of 70 ft. advances per shift in a 14 ft. wide room. A disadvantage of the Continuous Miner is the amount of fine coal created. This, of course, will vary with the friability of the coal but the amount of minus 1 in. coal can very well exceed 70

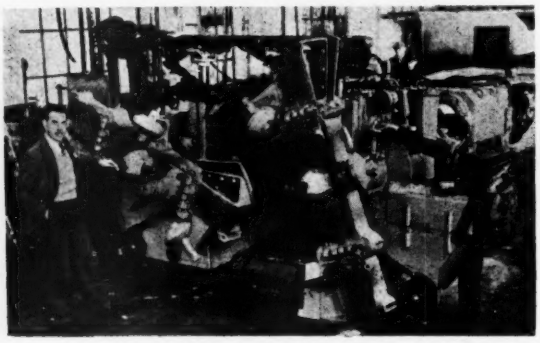


The Joy Continuous Miner

per cent. Where the coal is for coking such fragmentation is of little account but where size is a measure of selling value, degradation of this order is prohibitive. Although there are approximately 200 such Continuous Miners in use in the U.S.A. the general trend of opinion is that the Joy Continuous Miner has limited application in British Collieries.

THE MARIETTA MINER

A more recent machine is the Marietta Miner. This was designed for use in coal headings only and is used exclusively for this purpose in America, but trials are in progress with a Marietta Miner at Wellesley Colliery in Scotland in order to determine whether it can be applied to stone drivage in the sedimentary rocks of the locality.



The Marietta Miner

The machine is substantially constructed and weighs 28 tons, having overall dimensions of 25 ft. by 10 ft. by 6 ft. It has two main structural parts; the main frame with the cutting head and loading mechanism, and the caterpillar track frame. The cutting head consists of two rotating vertical arms each 7 ft. diameter and carrying six sets of tool holders with 26 picks. For rock drivage the picks are tipped with tungsten carbide. These revolving arms rotate at 15.6 r.p.m. and are forced into the face by advancing the machine on its caterpillar tracks. As the length of the vertical arms is greater than the 5 ft. 10 in. distance between centres of rotation the revolution of the arms must be synchronized in order to avoid contact.

GREAT POTENTIAL OUTPUT

In the general design of the machine the leading pilot drills are mounted at the centres of revolution of the cutting arms. These 4 in. diameter pilot drills aid the alignment of the machine. As the machine advances into the face boring two 7 ft. diameter overlapping holes, breaker rollers follow the circular kerfs, thus serving to burst the annular rings of coal outwards. The coal remaining between the overlapping holes is removed by top and bottom horizontal cutting chains mounted immediately behind the revolving arms, these chains carrying a total of 110 picks. Thus a roadway is driven having semi-circular sides and a flat roof and floor, maximum width being 12 ft. 10 in. and height 7 ft.

The dislodged coal is pushed into the throat of a chain conveyor by means of shovel plates attached to the ends of the revolving arms. This chain conveyor is 24 in. wide and is carried throughout the length of the machine and over a rear delivery jib or boom. This jib can be raised or slewed as required and directs the coal into the haulage medium following behind the machine. The rate of advance of the Marietta Miner depends upon the characteristics of the strata being driven through. In soft strata such as coal, so great is the potential output from the machine, that the limiting factor governing rate of advance is often the inability to maintain a transport medium of sufficient capacity and mobility to adequately deal with the flow of coal. When it is borne in mind that the excavated area is approximately 80 sq. ft. it will be appreciated that an advance of 3 in. per min. will result in an output of almost seven tons of coal per min.

The power units comprise a 70 h.p. electric motor driving the cutting arms, and a 25 h.p. motor actuating three hydraulic pumps, the chain conveyor and the caterpillar tracks. All controls are conveniently arranged to enable the machine to be operated by one person. The caterpillar tracks can be individually driven thus enabling the machine to negotiate curves. Despite its size the Marietta Miner can be flitted at speeds up to 30 ft. per min. when moving from one location to another, the cutting arms being capable of folding to facilitate this process.

Apart from the obvious advantage of high speed and relatively cheap drivage another feature worthy of mention is the fact that the smooth sides of the excavation make for reduced frictional losses in the air stream. It is claimed that the support of the roof is made easier in a heading driven by the Marietta Miner, and the uniformity of the roof coupled with the non-use of explosives in the driving of the heading give foundation to this claim. Whether or not the machine in its present form proves successful in stone headings remains to be seen but a smaller type of Miner to drive pilot drifts in such strata seems to offer possibilities.

Correspondence

PRESERVATION OF MINE TIMBER

To the Editor, *The Mining Journal.*

Sir,—We were interested to see that the U.S. Department of Agriculture has developed the "Collar method" of timber preservation (Technical Briefs, *The Mining Journal*, page 170, August 7). From the report it would seem that the process described is identical with that covered by Dr. Boucherie's first patent (Fr. pat. 11,061) granted in 1838—except that Dr. Boucherie had to be content to use a leather bag instead of a truck innertube!

This method was soon abandoned because it proved unreliable; some trees were treated satisfactorily, but in others the replacement of sap with preservative occurred only to a limited extent. However, the principle was sound and was developed into what is now called the Boucherie process, the essentials of which are described in Br. pat. 1369, dated 1855 and granted to H. Mathis on behalf of Dr. Boucherie. But its large scale use had to await the development of a suitable preservative. An illustrated outline of the process will be found in our Brochure 100, "Sap Replacement," and we also have available a 16 mm. colour/sound film called "Tanalith Boucherie" which describes the process in detail. This Company supplies "Tanalith" preservative to Finland, where 100,000 poles are treated annually by this method; it is regarded as being suitable primarily for poles, but there is no reason why it should not be used for roadway legs and props, or any other timber used in the round.

The Boucherie process has still not been fully utilized, despite the fact that it offers an inexpensive and efficient method of timber preservation. It is particularly suitable for countries where the right species of timber are plentiful and where vacuum/pressure impregnation plants are scarce. In Great Britain, of course, the reverse situation applies, and in any case pressure treatment is not expensive.

R. T. SMITHSON.

Publicity Officer, August 7, 1953.

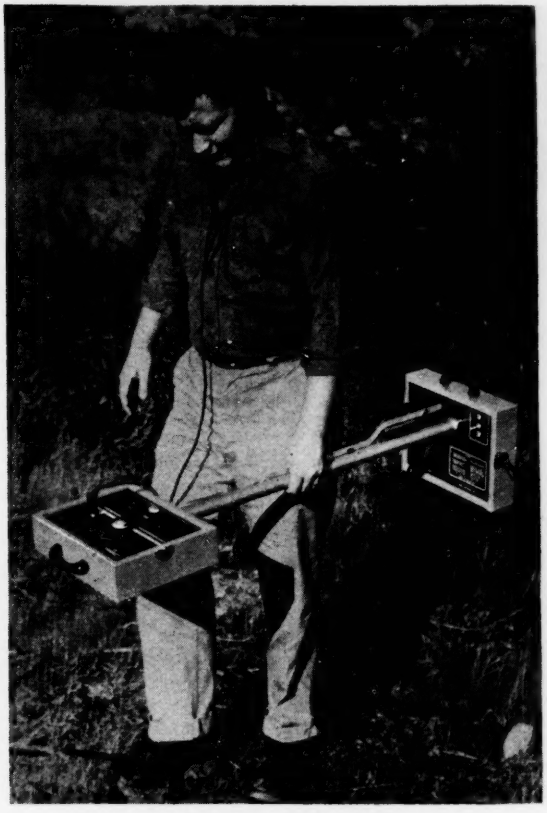
Hickson's Timber Impregnation Co. (G.B.) Ltd.

MACHINERY AND EQUIPMENT

An Improved Metal and Mineral Detector

An equipment named the Private Eye, a portable 10 lb. electronic detector for locating buried metals and minerals, is announced by The Radiac Company, Inc., of America. A simplified high-efficiency circuit is said to give this unit great sensitivity and power of penetration.

The manufacturers state that the Private Eye will detect buried metals and minerals, including gold and silver. It was designed for the ready use of public utility companies and engineers, as well as for the prospector. The instrument is as simple to operate as the normal radio set.



The Private Eye Equipment

The instrument is claimed to be rugged and compact, so that it may be used under rough field conditions. It will locate metallic objects submerged in fresh water, and may be used for marine salvage operations. The Private Eye is enclosed in a baked enamel aluminium case of modern design. It uses low voltage radio batteries and consists of a transmitter and receiver that may be folded in suitcase fashion when not in use.

A Range of Industrial Motors

Pamphlets, issued by Newman Industries Ltd., give details of the manufacturers' various types of industrial motors. The manufacturers state that efficiency within BSS 168/1936 has been maintained by employment within these products of latest types of insulation, cooling devices and manufacturing processes.

The Newman drip proof, slip ring and squirrel cage motors grade up to 200 h.p. By removal of the slip ring cover, easy access to the connections and brushes is possible and terminals are easily accessible in the terminal box, which can be placed on either side of the motor with the cable entry arranged either vertically or horizontally. The conduit adaptor is normally B.S. conduit thread but can be supplied for Briggs or metric threads. In so far as end bearing and fan arrangement is concerned, large metric size roller bearings are fitted and the fan is suitable for either direction of rotation, and large metric size ball bearings in the non-drive end bearing arrangement are components of a unit which ensures accurate axial location of the rotor.

The drip proof enclosure is suitable for voltages up to 650, 3-phase with outputs up to 200 h.p. The temperature rise after full load for six hours' run in these machines does not exceed 40 deg. C.

The manufacturers' totally enclosed fan cooled motors are the latest addition to the range and comprise a foot mounted motor with outputs from ½ h.p. to 25 h.p. to BSS CN(ELE) 6814 and BSS 168. They are for operation on 3-phase A.C. supply at 50 cycles with voltages up to 650. On the standard motor the terminal box is on the horizontal centre link and is fitted on the left hand side looking at the drive end, although this positioning can be changed to the right side by reversing the stator.

Fully Corded Industrial V-Belts

A pamphlet, recently received, presents comprehensive details on the care of the high test industrial V-belts manufactured by the British Tyre and Rubber Co. Ltd. As V-belt drives have become a popular form of power transmission, their performance and efficiency materially effect industrial economy, and the pamphlet deals with the care and maintenance, as well as installation and basic manufacturing principles of the V-belts produced by the company.

Driers for the Mining Industry

In *The Mining Journal* of December 19, 1952, an article describing those products manufactured for the mining industry by Head, Wrightson and Co. Ltd., made mention of Lowden driers. The article pointed out that the units were made at the Stockton Forge plant of the company under licences from American associates.

A recent publication from the manufacturers deals more comprehensively with these units, and points out that the Lowden was designed to dry those extremely fine materials which form a sticky mass when met, tend to congeal or clog in rotary or other types of driers and yet are liable to excessive dust losses when dry. Such materials are flotation concentrates, graphites, clays, ground mineral products and the like.

The drier unit consists of a hearth heated from below, and a rabbling mechanism utilized for conveying the material over it. Baffled flues between hearth plates on the side and end walls conduct combustion gases from a firebox to a stack. The rabbles are attached to rake frames suspended by levers from rocking shafts carried on sliding frames, and these shafts and frames are actuated by the driving gear through cranks on connecting rods so that the rake frames follow a rectangular path in the sequence of forward on the hearth, up, back in the clear, and down. It is the peculiar and characteristic action of this rabbling mechanism which is claimed to sharply distinguish the Lowden drier from other hearth driers. The unit is claimed further to effect economies in labour, maintenance and power.

The drier weights cover all iron and steelworks except stacks, motors and oil or gas burning equipment. Driers range in width from 2½ ft. to 12 ft. and in corresponding lengths from 24 ft. to 72 ft. The units thus cover areas from 60 sq. ft. in the 2½ x 24 ft. model to 864 sq. ft. in the 12 x 72 ft. model. The smallest unit weighs 10,500 lb. and the largest 97,800 lb. Drier stacks grade up from 10 in. diameter at a weight of 400 lb. to 34 in. diameter at a weight of 1,800 lb. The driving motors have powers of from 1 to 9 h.p. The stack weights cover guyed stacks 40 ft. in height, and driers from 24 ft. to 28 ft. in length are provided with two rockshafts, while those from 30 ft. to 40 ft., 42 ft. to 52 ft., 54 ft. to 60 ft. and 64 ft. to 72 ft. length are fitted with 3, 4, 5 and 6 rockshafts respectively. Under normal operating conditions the heat available for drying is 3,400 B.Th.U. per sq. ft. of hearth area.

METALS, MINERALS AND ALLOYS

COPPER.—Prices have advanced daily on the Metal Exchange this week with a corresponding influence on sentiment abroad. The low price at which copper opened last week had a depressing effect on sentiment in the United States and in Chile so the improvement here has been welcomed. A fairly good demand for copper is reported by the big U.S. producers for August and the world export price in New York is now 28.50-30 c., though the reduction is said to be more a matter of adjustment than of any real price change. Discussions on the disposal of the accumulations of metal in Chile have reached the point where the Chilean ambassador in Washington has announced that his government is offering the U.S. 65,000 tons of copper for the U.S. stockpile at the "world market" price. Inter-departmental meetings by the United States departments are understood to be now proceeding on the question, after which real negotiations with Chile can start, unless the Administration decides that it does not need this copper. The Chilean Government obviously does not want the copper to come freely on the market. However, the dissolution of the R.F.C., coupled with the reduced credit facilities believed to have been extended to the department taking over from it, may incline the Administration to look this gift-horse in the mouth. All new copper commitments for the U.S. stockpile were frozen on April 10 and this, according to a spokesman of the G.S.A., is still in effect. He also stated that the expansion of the D.M.P.A. programme has progressed sufficiently far to ensure the national stockpile goal. The ultimate decision is said to rest with the Defence Mobiliser, Mr. Arthur Fleming. It is reported from Bonn that the Norddeutsche Refinerie proposes to buy 13,000 tons of Chilean blister and 5,000 tons of concentrates next year, providing the price is satisfactory. However, the German Government has postponed general trade negotiations with Chile so that it can negotiate copper deliveries which form the principal part of the proposed agreement. The Chilean Finance Minister has stated that the medium and small producers may now export freely without recourse to Government services if the metal is sold below 36½ c. delivered.

The labour dispute on the Copperbelt is still unsettled, and African mineworkers are taking a ballot of their members, the result of which is not yet known. So far only one dispute has been officially notified to the Government, but at a meeting in Kitwe at the end of last week between the copper mining companies and the leaders of the African workers trade union, with the Commissioner of Labour and Mines in the chair, there was a general discussion arising of a number of disputes now existing. Members of the African Mineworkers' Union have apparently been asked to endorse whatever action their leaders may decide on. So far little has been said about the line which the European mineworkers would taken but at Nchanga they are said to have agreed to work the mine should the Africans finally decide to call a strike. Provided the railway workers do not become involved, the companies might see in the strike an opportunity to increase their stocks of fuel which have been the chief impediment to increased output for a considerable time past. A strike might also improve the price of copper.

LEAD.—The price on the London Metal Exchange has shown an improvement this week. In America the market is reported to be steady with consumers in holiday mood. There has been a substantial reduction in stocks of late which on July 1 stood at 43,232 tons compared with 53,115 s.tons a month earlier, and is the lowest figure since the end of January. The United States Smelting and Refining Company reports a loss in the first six months of the year of $740,376 compared with a profit of $1,900,949 in the same period last year. The president of the company attributes the change in its fortunes to foreign lead and zinc being dumped. At least this result serves to explain the violence of the efforts made to increase import duties.

TIN.—Tin prices have been steadier since last week with slight indications of improvement. There is generally little fresh to notice. The International Tin Study Group announce that 15 governments in the group failed to observe the deadline, August 15, for replying to the Group's request for their views and it was therefore impossible to say yet whether the projected conference will be called or not.

Meanwhile there is still no evidence that the fall in prices is seriously reducing output. Straits shipments in July are reported at 5,257 tons (U.S. 2,765, Continent 802, U.K. 632, Pacific destinations 582, India 236, South America 178, Australasia 120, Middle East 50, Africa 16). This figure compares with 3,897 tons in June. Total stocks of tin in all forms in Malaya at the end of June are reported as 5,883 tons as compared with 4,959 tons at the end of May. Indonesian production in July is reported at 3,200 tons, the highest since August of last year, bringing the total to 18,838 tons for the seven months, compared with 19,285 tons for the same period last year. Production of metal by the Longhorn smelter in July is again given at the round figure of 3,000 tons, the same as in the previous month of June. Production for the seven months was 24,170 tons, the largest since 1946. Concentrates imported into the States in July totalled 775 tons.

The issue of whether the Texas smelter should be sold to private interests as proposed by Representative Thompson, of Texas, is reported to be arousing more interest now that the R.F.C. is being liquidated.

Washington reports state that the R.F.C. recently sent to the Bolivian Ambassador a draft contract for the purchase of Bolivian concentrates, based on the prevailing free market, and covering all Bolivian production beyond the regular supplies to Britain. The contract, however, would only cover a year's production.

ZINC.—Prices have been rather firmer this week on the Metal Exchange otherwise there is nothing to note. In the United States where the E. St. Louis price for Prime Western is still 10.75-11.50 c., the confused situation due to alterations and the basing system continues and business is reported quiet. Stocks at the end of July continued the small increase of recent months, being reported 103,906 s.tons. Unfilled orders, however, were substantially less at 32,327 tons. Output showed little change at 80,825 compared with 81,617 s.tons.

ASBESTOS.—The demand for and production of asbestos fibre is reported by *Asbestos* as running generally at a level rate approximately the same as a year ago but approximately 10 per cent under capacity. Shortages still exist in the better grades of spinning fibre and in some of the better quality shorts. A slight pick up is foreseen for the second half of the year.

MANGANESE.—An official note has been issued in Delhi that the government of India intends to revise the system of export licensing for manganese ore, and exporters are warned not to enter into fresh commitments which cannot be completed before October 15 next. Shippers have been asked to declare their outstanding commitments and the complete exports against them up to that date. They have also to furnish the port authorities with full particulars of all shipments since January, 1950, up to June 30 last.

Russian offers have now been received in London of washed Poti ore 48 per cent at $1.22-1.24 per unit.

NICKEL.—The two-year gentleman's agreement between the Canadian Defence Production Department and certain Canadian fabricators to reserve nickel supplies for defence has been ended as there has been a major improvement in the supply situation. In the United States the impression exists that a start will be made in lifting restrictions on use after October 1. National Lead has taken over the distribution of all the output of the Nicaro Nickel Plant in Cuba. Beginning next January a sintering plant is to be started and research is being conducted towards the eventual production of nickel in metal form.

TITANIUM.—Further developments to those noted in this column last week in the production of titanium products are announced. The U.S. Defense Mobilization Office has ordered a 3,000 ton expansion in capacity to produce titanium sponge and an enlargement of the target to be attained by 1956 of 25,000 s.tons annually. This would be further enlarged if other sources of the metal can be found. The Crane Company's subsidiary, Cramet Inc., has announced that a plant to produce titanium sponge will be constructed under Government contract, which calls for an output of 6,000 s.tons of sponge yearly.

Production is expected to start early in 1955 reaching full production a year later.

At home the Ministry of Materials announces that it has recently concluded a contract with Imperial Chemical Industries Limited under which the company will, at its own expense, erect capacity to produce 1,500 tons of sponge titanium a year. The company will also install capacity for converting this metal to ingot form, and it expects production to begin in two years' time. The Ministry has undertaken to buy directly up to three quarters of the company's output of sponge titanium over the first four years of production if the metal is not otherwise sold in various forms for use by Government contractors, and the Ministry has an option on the full output if needed for defence purposes. The price of the metal will be equivalent to the world price current at the time of purchase. The Ministry also understands that I.C.I. already has in course of erection pilot plants which will begin to produce at the rate of 150 tons per annum early in 1954.

GOLD.—S. African gold output in July showed a substantial gain at 1,030,089 f.oz. (Transvaal 941,280, O.F.S. 43,525, miscellaneous 45,284) compared with 969,821 f.oz. in June.

Iron and Steel

After achieving a record output of over 9,000,000 tons of steel in the first half of this year the men engaged at the iron and steel plants were entitled to a holiday and they have taken full advantage of the extension of their holiday period to two weeks with pay. Nevertheless, producers will be glad when full scale operations can be resumed and in anticipation of that event they have been piling up stocks of fuel, ore and scrap. The markets are still extremely quiet but most of the users have substantial tonnages on order and the steady progress with the second and third stages of the industry's development plan bespeaks quiet confidence in the further outlook.

Shipbuilders have resumed their lamentations about the scarcity of steel plates and the disastrous affect upon their building programmes. It may be recalled that a plan was devised for the voluntary control of plate distribution. This is due to come into operation in October and already Sir Frederick Rebbeck, chairman and managing director of Harland and Wolff, has affirmed that his company's first allocation shows no appreciable increase in the tonnages they have recently received. It is an awkward bottleneck. All the plate mills are working to the limit of their capacity and any increase in prompt supplies can only come from abroad. Heavy section and rail mills have made considerable progress in overtaking their commitments, and re-rollers of light sections and small bars are seeking overseas orders to absorb their surplus outputs. Unfortunately some of the Continental mills are similarly situated and Belgian exporters are cutting below the recently reduced British export quotation. Pig iron supplies are rather more plenitful owing to reduced consumption during the holiday period but any small tonnages taken into stock will probably be quickly liquidated when normal conditions are restored. For much the same reasons scrap deliveries have been curtailed, but merchants are assured of outlets for all the heavy material they have to offer, and it is only the lighter grades of scrap which are slow of sale.

The London Metal Market

(From Our Metal Exchange Correspondent)

The tin market has maintained its firmer undertone and prices have risen slightly. The main interest is now centred in the possibility of an international conference, and it is understood that countries are being given a certain latitude in respect of the date by which they must give their replies to the invitation. Some sections of the trade which are critical of the London Metal Exchange seem to think that agreed restrictions on production and the establishment of a buffer pool could take place without reference to the London market, but it is pertinent to ask where else in the world the controller of a buffer stock would be able to operate freely other than on the London Metal Exchange. The Eastern price on Thursday morning was equivalent to £600¼ per ton c.i.f. Europe.

A demand for August lead has given rise to an increase in the backwardation, and the price level has risen owing to good demand in general. As the shortage of nearby metal seems likely to continue a serious recession in the price cannot be expected, although the peak demand in the States is already past and opinion there is that lower levels will be seen in the autumn.

Zinc remains featureless, except that the contango which has existed for some time has now disappeared, and should consumer demand for g.o.b. grades improve a backwardation may also develop in this metal.

The first week of the copper market can be considered very satisfactory and the price has shown a rising tendency due to good all-round demand for forward metal. The Government Broker has not been called upon to sell very much "cash" metal, as trade sources have been able to offer nearly all that has been wanted. Opinion on the outlook is divided, as one party lays stress on the Chilean copper which is overhanging the market, whilst the other draws attention to the paragraphs in the daily press referring to possible strikes in Rhodesia, but if neither of these two considerations play a part in the immediate future the present demand both in the U.K. and on the Continent is likely to ensure a rising price.

Closing prices and turnovers for the week are given in the following table:

	August 6		August 13	
	Buyers	*Sellers*	*Buyers*	*Sellers*
Tin				
Cash	£576	£577½	£592½	£595
Three months	£572½	£577½	£590	£592½
Settlement	£577½		£595	
Week's turnover	305 tons		475 tons	
Lead				
Current month	£92½	£92¾	£95¾	£96
Three months	£87½	£87¾	£89¾	£90
Week's turnover	4,500 tons		4,300 tons	
Zinc				
Current month	£72½	£72¾	£74	£74½
Three months	£72¾	£73	£74	£74¼
Week's turnover	4,075 tons		2,900 tons	
Copper				
Cash	£214	£216	£230	£232½
Three months	£197½	£199	£210	£211
Settlement	£216		£232½	
Turnover 5th/6th Aug.	4,075 tons		5,050 tons	

AUGUST 13 PRICES

COPPER, TIN, LEAD AND ZINC

(See our London Metal Exchange report for Thursday's prices)

ANTIMONY

English (99%) delivered, 10 cwt. and over .. .. £225 per ton
Crude (70%) .. .. .. £210 per ton
Ore (60% basis) .. .. .. 20s. — 22s. nom. per unit, c.i.f.

NICKEL

99.5% (home trade) .. .. £483 per ton

OTHER METALS

Aluminium, 99·5% £150 per ton
Bismuth (min. 4 cwt. lots) 17s. lb.
Cadmium (Empire), 13s. 10d./14s. 4d. lb.
Chromium, 6s. 5d./7s. 6d. lb.
Cobalt, 20s. lb.
Gold, 248s. f.oz.
Iridium, £60 oz. nom.
Magnesium, 2s. 10½d. lb.
Manganese Metal (96%-98%) £280/£295
Osmiridium, £40 oz. nom.
Osmium, £65/70 oz. nom.
Palladium, £7 15s./£8 10s. oz.
Platinum, £27/£33 5s.
Rhodium, £42 10s. oz.
Ruthenium, £25 oz.
Quicksilver, £70 5s./£70 10s. ex-warehouse
Selenium, 30s. 6d. nom. per lb.
Silver 74d. f.oz. spot and f'd
Tellurium, 15s./16s. lb.

ORES, ALLOYS, ETC.

Bismuth .. .. 20% 3s. 9d. lb. c.i.f.
60% 8s. 9d. lb. c.i.f.
Chrome Ore—
Rhodesian Metallurgical (lumpy) £14 8s. 0d. per ton c.i.f.
„ „ (concentrates) £14 8s. 0d. per ton c.i.f.
„ „ Refractory £14 0s. 0d. per ton c.i.f.
Baluchistan Metallurgical .. £16 11s. 6d. per ton c.i.f.
Magnesite, ground calcined .. £26 - £27 d/d
Magnesite, Raw .. .. .. £10 - £11 d/d
Molybdenite (85% basis) .. 103s. 10½d. per unit c.i.f.
Wolfram (65%) .. .. .. World buying 305s. - 315s.
„ „ .. .. .. 327s. 6d. U.K. Selling
Scheelite .. .. World buying 295s. - 300s.
„ .. .. 312s. 6d. U.K. Selling
Tungsten Metal Powder .. .. 24s. 3d. - 27s. nom. per lb. (for steel manufacture) (home)
Ferro-tungsten .. .. .. 21s. 4d. nom. per lb. (home)
Carbide, 4-cwt. lots .. .. £35 13s. 9d. d/d per ton
Ferro-manganese, home .. .. £49 15s. 0d. per ton
Manganese Ore Indian c.i.f. Europe (46%-48%) .. .. .. 7s. 11d. - 8s. 7d. per unit
Brass Wire .. .. 2s. 5½d. per lb. basis
Brass Tubes, solid drawn .. 1s. 10d. per lb. basis

THE MINING MARKETS

(By Our Stock Exchange Correspondent)

Stock markets remained firm in spite of the holidays. The volume of business was better but not large. Gilt-edged were steady after the recent new issues. Revenue figures for the week continued encouraging. There was a £19,600,000 overall surplus and the running deficit for the year to date is now some £115,000,000 less than for the same period last year.

Kaffirs started with an easier trend, mainly due to forced selling in Johannesburg brought about by two failures. This fall was accentuated by the fact that Paris was cut off by the French strikes, and the usual seasonal fall in native labour on the Rand. Towards the end of the week the market hardened and some recovery set in. Small buyers found the market short of stock. A feature was the announcement that Selection Trust have acquired a substantial holding in Vaal Reefs; these shares advanced following the news to 15s. 9d. The mine is a promising property developing on the Far West Rand. Although mainly interested in Rhodesian copper shares and diamond holdings, Selection Trust already have a stake in the O.F.S. through their interest in St. Helena and Western Holdings.

In the O.F.S. market itself matters were rather brighter. There was buying of Freddies group shares which was rather vaguely attributed to news of good development results. No positive information was forthcoming. Free State Geduld made a £4,000,000 offer of 6 per cent convertible notes at 55s. each. Option holders will receive one note for every option held. The conversion right on the new notes will hold good until January 29, 1955. The Anglo American Corporation will subscribe for the balance of £1,375,000. Merriespruit announced results from their KA3 borehole. Two conglomerate bands were intersected at 2,823 ft. and 2,834 ft. giving values of 436 and 146 in. dwt. respectively.

Much more interest was displayed in the West African section. Favourable press mention of the Ashanti figures brought in buyers on a market short of stock. The quarterly returns from the Gold Coast Selection Trust group were encouraging for the Amalgamated Banket shares. Full load deliveries of ore from the Fanti section started on July 30 and it is stated that encouraging development values have been met. Marlu, Bremang, and Ariston all returned lower figures.

In the Australian section there was little of interest, but Mount Morgan eased in spite of better profit figures which came out at £A448,026 after depreciation of £A100,000 against £A365,578 for the previous twelve months.

In the miscellaneous market, Indian gold shares awoke to unwonted vigour following strong rumours of cash distributions.

Coppers remained uncertain. The recovery in the metal price was set off against the labour troubles among native miners in Northern Rhodesia. Against this it is worth noting that the European mineworkers have agreed to carry on work in the event of the Africans striking. It is believed that the Nchanga mine could run for two years without native labour, although this would, of course, seriously affect development.

A recovery in tin shares was widespread. The steadier metal price and talk in Malaya to the end that the United Nations Tin Conference be reconvened, brought this about. In addition, there was of course the usual reaction which always occurs in share markets after a sharp movement one way or the other. Beralts showed considerable improvement on talk of a reduction in the tax on wolfram by the Portuguese Government. In the Niverian section, Jantar rose sharply due to persistent buying of the shares with little stock offered.

Elsewhere the main features were renewed interest in manganese and asbestos producers and share prices of these leading groups went ahead.

In the oil market, there was some profit-taking in Anglo-Iranian shares after their sharp advance. Although latest production figures from Kuwait indicate a steady expansion of output. Attock Oil also encountered some profit-taking, but Shell rose on steady investment buying and there was again some speculative demand for Ultramar.

FINANCE	Price Aug. 12	+ or — on week
African & European	2½	+½
Anglo American Corpn.	5⅜	—⅛
Anglo-French	17/6	.....
Anglo Transvaal Consol.	21/3	.....
Central Mining (£1 shrs.)	29/4½	.....
Consolidated Goldfields	46/-	—3d
Consol. Mines Selection	25/7½	.....
East Rand Consols	2/7½	.....
General Mining	3⅜	.....
H.E. Prop	37/6	+7½d
Henderson's Transvaal	7/3	.....
Johnnies	50/-	—2/6
Rand Mines	3⅛	+⅛
Rand Selection	32/6	—1/10½
Strathmore Consol.	32/6	.....
Union Corp. (2/6 units)	28/-	—6d
Vereeniging Estates	3½	.....
Writs	34/4½	—7½d
West Wits	42/6	—1/3
RAND GOLD		
Blyvoors	40/6	—6d
Brakpan	11/3	+7½d
City Deep	18/9	—7½d
Consol. Main Reef	18/9	—7½d
Crown	33/1½	.....
Daggas	3⅛	—⅛
Doornfontein	23/-	—3d
Durban Deep	36/3	—1/3
E. Daggas	14/4½	—7½d
E. Geduld ... (4/- units)	33/3	+9d
E. Rand Props	2½	.....
Geduld	4⅛	.....
Govt. Areas	13/-	.....
Grootvlei	23/-	+6d
Libanon	10/-	.....
Luipaards Vlei	22/9	—6d
Marievale	19/-	.....
Modderfontein East	17/6	.....
New Kleinfontein	20/-	—6d
New Pioneer	18/6	—3d
Randfontein	42/10½	—1½d
Robinson Deep	10/9	+3d
Rose Deep	13/9	.....
Simmer & Jack	5/-	.....
S.A. Lands	23/9	+7½d
Springs	4/9	.....
Stilfontein	28/3	—3d
Sub Nigel	2½	—⅛
Van Dyk	6/3	—6d
Venterspost	13/6	—3d
Vlakfontein	14/-	—3d
Vogelstruisbult	32/9	—3d
West Driefontein	6½	—⅛
W. Rand Consolidated	54/4½	—1/3
Western Reefs	49/-	—4½d
O.F.S.		
Freddies	10/6	+3d
Freddies N.	10/-	+7½d
Freddies S.	9/9	+7½d
F. S. Geduld	2⅛	—⅛
Geoffries	15/-	—3d
Harmony	23/9	+3d
Loraine	8/10½	+1½d
Lydenburg Estates	12/9	—3d
Merriespruit	8/9	—3d
Middle Wits	15/9	—6d
Ofsits	36/10½	—7½d
President Brand	28/-	—3d
President Steyn	21/7½	—4½d
St. Helena	13/1½	—1½d
Virginia Ord.	12/9	—3d
Welkom	20/4½	—1/-
Western Holdings	3⅜	—⅛
WEST AFRICAN GOLD		
Amalgamated Banket	1/6	.....
Ariston	6/3	.....
Ashanti	21/-	+6d
Bibiani	5/9	+1½d
Bremang	2/1½	.....
G.C. Main Reef	3/7½	+1½d
G.C. Selection Trust	6/4½	+4½d
Konongo	2/9	+4½d
Lyndhurst Deep	1/-	.....
Marlu	1/3	.....
Taquah & Abosso	3/4½	+1½d
AUSTRALIAN GOLD		
Boulder Perseverance	2/9	+3d
Gold Mines of Kalgoorlie	12/9	—3d
Great Boulder Prop.	10/-	—3d
Lake View and Star	15/-XD	+3d
Mount Morgan	17/9	—6d
North Kalgurli	6/9XD	—4½d
Sons of Gwalia	6/6	—3d
South Kalgurli	7/-XD	—9d
Western Mining	13/1½	—1½d
MISCELLANEOUS GOLD		
Cam and Motor	9/-	.....
Champion Reef	5/4½	+10½d
Falcon Mines	6/6	.....
Globe & Phoenix	26/-	.....
G.F. Rhodesian	5/-	.....
London & Rhodesian	5/-	+1½d
Motapa	1/7½	.....
Mysore	3/6	+10½d
Nundydroog	6/1½	+7½d
Ooregum	3/3	+7½d
Oroville	10/3	.....
MISCELLANEOUS GOLD (contd.)		
St. John d'El Rey	24/6	.....
Zams	25/3	—9d
DIAMONDS & PLATINUM		
Anglo American Inv.	3½	+⅛
Casts	18/9	+9d
Cons. Diam. of S.W.A.	4⅛	—⅛
De Beers Defd. Bearer	62/6	+3d
De Beers Pfd. Bearer	14½	.....
Pots Platinum	7/6	.....
Watervaal	13/-	.....
COPPER		
Chartered	50/10½	—1½d
Esperanza	4/4½	+1½d
Indian Copper	4/1½	.....
Messina	3½	—⅛
Nchanga	6⅜	—⅛
Rhod. Anglo-American	49/3	.....
Rhod. Katanga	8/6	+1½d
Rhodesian Selection	14/1½	+1½d
Rhokana	18½	+⅛
Rio Tinto	20½	.....
Roan Antelope	13/3	+1½d
Selection Trust	30/3	—4½d
Tanks	57/6	—3d
Tharsis Sulphur Br.	41/3	.....
TIN (Eastern)		
Ayer Hitam	23/9	+2/-
Bangrin	8/3	+3d
Gopeng	7/9	+3d
Hongkong	6/3	+1/
Ipoh	14/4½	+1/10½
Kamunting	7/9	+3d
Kepong Dredging	4/3	+3d
Kinta Tin Mines	9/9	+1/3
Malayan Dredging	22/3	+6d
Pahang	12/6	+6d
Pengkalen	7/6	+3d
Petaling	8/7½XD	+6d
Rambutan	10/-	.....
Siamese Tin	8/10½	+7½d
Southern Kinta	12/1½	.....
S. Malayan	21/6	+2/3
S. Tronoh	7/6	+6d
Sungei Kinta	10/-	+6d
Tekka Taiping	4/7½	+1½d
Tronoh	22/6	+1/-
TIN (Nigerian and Miscellaneous)		
Amalgamated Tin	8/7½	—1½d
Beralt Tin	28/1½	+1/10½
Bisichi	3/7½	+1½d
British Tin Inv.	13/-	.....
Ex-Lands Nigeria	3/7½	—1½d
TIN (Nigerian and Miscellaneous) contd.		
Geevor Tin	9/9	+9d
Gold & Base Metal	3/4½	.....
Jantar Nigeria	13/4½	+1/1½
Jos Tin Area	11/3	.....
Kaduna Prospectors	2/3	+3d
Kaduna Syndicate	1/10½	—1½d
London Tin	4/10½	+1½d
United Tin	2/1½	+1½d
SILVER, LEAD, ZINC		
Broken Hill South	42/6	—7½d
Burma Mines	1/4½	—1½d
Consol. Zinc	26/3	.....
Lake George	10/-	+1½d
Mount Isa	32/9	+3d
New Broken Hill	21/3	—3d
North Broken Hill	53/9	.....
Rhodesian Broken Hill	10/4½	.....
San Francisco Mines	19/4½	+1/1½
Uruwira	3/-	.....
MISCELLANEOUS		
BASE METALS & COAL		
Amal. Collieries of S.A.	44/6	.....
Associated Manganese	48/-	+3/6
Cape Asbestos	20/10½	+9d
C.P. Manganese	51/10½	.....
Consol. Murchison	22/3	+1/3
Mashaba	4½d	.....
Natal Navigation	3½	+⅛
Rhod. Monteleo	5/-	.....
Turner & Newall	56/-	+4½d
Wankie	13/6XD	+4½d
Witbank Colliery	3⅛	.....
CANADIAN MINES		
Dome	$32	+1
Hollinger	$27½	+½
Hudson Bay Mining	$81	—1
International Nickel	$73¾	—¾
Mining Corpn. of Canada	£4⅛	—⅛
Noranda	$123	.....
Quemont	£6½	.....
Yukon	4/-	.....
OIL		
Anglo-Iranian	7½	—⅛
Apex	39/4½	.....
Attock	34/4½	—7½d
Burmah	52/6	.....
Canadian Eagle	30/1½	+1½d
Mexican Eagle	22/6	+1/-
Shell (bearer)	4½	+⅛
Trinidad Leasehold	28/3	+3d
T.P.D.	24/-	.....
Ultramar	24/6	+1/6

COMPANY NEWS AND VIEWS

Rand and O.F.S. Returns for July

Although the revenue of the Rand and O.F.S. gold mines during July was based on a gold price of 246s. 11d. compared with 247s. 1d. in June, there were several sharp advances in both the tonnage milled and profits achieved. This comment applies particularly to Blyvooruitzicht, East Rand Proprietary, East Geduld, Grootvlei, Vogels, and Daggafontein—although there were numerous other mines amongst the older producers which also made commendable improvements over their June returns. Against the general trend were Durban Deep and Van Dyk. This latter company announced a loss of £16,047 which was, however, due to operations underground being affected by a fire towards the end of the month. The loss of profits, it is stated, is covered by insurance.

The outstanding point about the July returns is that it includes, for the first time, production details of three new Orange Free State producers; Western Holdings in the Anglo American Corporation of South Africa group, and the two "Freddies"—Freddies North and Freddies South in the "Johnnies" group.

Company	*July*, 1953 Tons (000)	Yield (oz.)	Profit (£000)	Yr. ends	*Current Financial Year* Total to Date Tons (000)	Yield (oz.)	Profit (£000)	*Last Financial Year* Total to Date Tons (000)	Yield (oz.)	Profit (£000)
Gold Fields										
Libanon	83	16,810	41·9	J	83	16,810	41·9	83	16,604	42·5
Luipaards Vlei	108	20,037	44·8	J	108	20,037	44·8	104	19,485	52·3
Rietfontein	28	6,109	25·6	D	186	41,588	177·7	190	42,094	194·3
Robinson	102	20,395	14·3	D	679	131,234	91·8	789	128,763	78·2
Simmer & Jack	125	19,981	12·6	D	848	37,838	89·1	870	138,569	117·4
Sub Nigel	67	22,278	103·9	J	67	22,278	103·9	69	23,840	128·8
Venterspost	103	24,154	55·6	J	103	24,154	55·6	105	23,625	60·7
Vlakfontein	38	13,681	74·8	D	254	92,605	495·1	259	96,643	552·1
Vogels	103	26,337	107·9	D	673	170,468	682·2	555	144,902	563·1
West Drei	42	29,793	233·5	J	42	29,793	233·5	26	14,695	99·3
Anglo-American*										
Brakpan	117	20,923	25·3	D	801	143,415	150·0	814	148,010	261·0
Daggas	222	52,164	331·6	D	1537	362,715	2342·2	1631	388,994	2763·7
E. Daggas	94	16,208	48·5	D	630	109,860	337·8	677	121,108	446
S. A. Lands	102	18,646	53·2	D	699	127,277	357·1	667	120,312	434·5
Springs	146	20,002	10·1	D	1035	142,601	75·3	1153	150,859	129·4
Welkom	66	13,375	16·3	D	427	85,160	113·9	330	54,308	L 64·0
Wn. Holdings	33	8,414	5·0	D	—	—	—	—	—	—
W. Reef Ex.	111	22,565	79·3	D	757	155,602	566·2	777·5	162,952	724·3
Central Mining										
Blyvoor	105	62,234	519·2	J	105	62,234	519·2	112	68,397	604·4
City Deep	169	32,187	20·3	D	1112	215,409	159·9	1077	216,903	184·7
Consol M. R.	176	24,208	19·6	J	176	24,208	19·6	188	26,111	34·6
Crown	280	44,015	40·1	D	1863	297,760	267·3	1869	303,536	262·3
D. Roodeport	180	29,914	48·8	D	1246	211,962	479·7	1258	215,802	584·5
E. Rand Prop.	200	44,455	123·7	D	1313	287,893	732·8	1459	312,411	1057
Modder B.	57	5,879	1·1	D	379	40,754	11·5	398	43,927	47·5
Modder East	125	14,086	18·0	J	125	14,086	18·0	122	14,041	23·5
Rose Deep	74	11,269	10·5	D	516	76,398	54·1	588	81,679	74·8
Welgedacht	35	4,326	4·0	J	35	4,326	4·0	35	4,320	4·5
J.C.I.*										
East Champ	25	3,606	L 2·0	D	170	27,422	9·7	217	32,780	58·4
Freddies Nth	22	3,158	L15·5	D	—	—	—	—	—	—
Freddies Sth	34	5,168	L25·5	D	—	—	—	—	—	—
Gov. G.M.A.	256	34,361	50·1	D	1708	233,299	400·6	1688	223,888	347·8
New State	24	3,662	1·0	D	217	32,935	7·0	317	45,309	7·2
Randfontein	310	38,759	25·1	D	2143	275,065	191·9	2462	291,757	205·5
Wit Gold	58	5,473	L18·3	D	406	44,061	L 57·8	417	49,778	17·4
Union										
East Geduld	145	43,501	329·9	D	951	285,297	2123·3	1015	304,528	2410·1
Geduld Prop.	98	15,694	32·7	D	669	105,649	227·7	734	106,507	254·7
Grootvlei	193	41,010	239·4	D	1288	274,750	1619·6	1363	295,347	189·8
Marievale	67	16,146	68·6	D	437	106,963	465·8	424	106,173	493·7
St. Helena	67	13,410	25·2	D	439	87,532	138·4	323	63,689	28·1
Van Dyk	77	12,567	L16·0	D	620	100,185	15·5	751	108,518	87·1
General Mining*										
S. Roodepoort	29	6,160	20·5	J	29	6,160	20·8	28·5	6,325	24·5
W. Rand Cons	226	31,350	83·1	D	1566	219,695	632·2	1474	230,593	867·5
Anglo-Transvaal*										
N. Klerksdorp	11	1,452	0·7	D	72	9,879	6·0	77·6	8,729	7·2
Rand Leases	160	27,442	12·3	J	160	27,442	12·3	188	31,388	73·6
Village M.R.	34	5,295	12·0	J	34	5,295	12·0	34	5,288	15·1
Others										
N. Kleinf'tein	110	14,155	25·0	D	744	96,394	185·3	740	97,422	518
Spaarwater	11	2,435	L 2·9	D	72	16,579	L 23·1	72·4	16,550	L 19·1
Stilfontein	66	20,141	104·1	D	433	123,568	598·5	—	—	—
W. Nigel*	17	3,831	6·0	J	17	3,831	6·0	16·5	—	6·5

Notes.—Profit figures are in all cases figures of working profit excluding profit from sale of gold at premium prices. In case of groups marked with an asterisk (*) profit includes sundry revenue. Profit figures preceded by L indicate a loss.

While production officially commenced at Western Holdings on July 1 last, the plant has been subject to running-in trials for some time and it was expected that the first official monthly return would show a small profit. Costs per ton were given as 60s. 1d. but this excluded the cost of development in excess of that required to maintain current milling operations, which is being charged to revenue. Gold recovery works out at over 5 dwt. per ton.

Excluding expenditure on development, Freddies North announced a loss of £25,485 and Freddies South a loss of £15,467. In announcing these results the two companies state that the quantity of development is at present inadequate to provide sufficient stope faces to enable full stoping and milling operations to be undertaken, but production on a limited scale was begun in July to provide revenue to assist in meeting expenditure.

Of the other new mines to become producers, Welkom continued to disappoint; St. Helena managed to show a further small advance; while Stilfontein and West Driefontein made yet another excellent showing.

G.C. Selection Trust Group June Quarterly Results

The five West African gold producers in the Gold Coast Selection Trust group published their results for the June quarter at the beginning of this week.

As the table below shows only Amalgamated Banket and Gold Coast Main Reef returned profit figures comparable to the previous quarter. By contrast Marlu, which milled a lower grade of ore than in the preceding quarter, experienced a sharp fall in its quarterly profit figure as did Ariston.

Company	*Sept. Qtr.* £ (*1952*)	*Dec. Qtr.* £ (*1952*)	*Mar. Qtr.* £ (*1953*)	*June Qtr.* £ (*1953*)
Amalgamated Banket	94,786	92,475	74,168	74,200
Ariston Gold Mines	166,011	170,443	150,087	113,583
Bremang Gold	59,059	11,202*	44,331	39,584
Gold Coast Mine Reef	39,334	44,735	41,247	41,471
Marlu Gold	35,938	35,658	50,035	37,454

* Total excludes £1,963 recovered from a clean-up

Amalgamated Banket had some cheering news to impart to shareholders; the aerial ropeway from the Fanti section to the Central Mill was completed shortly after the close of the March quarter and full load deliveries of ore from Fanti to the Central Mill commenced on July 30. Additionally, encouraging development results were reported from this section.

At Gold Coast Main Reef footage payable in a drive over 132 ft. on level 13 in the Tuappim section averaged 11.55 dwt. per ton over a width of 66.7 in., equivalent to 770 in. dwt.

The quarterly report of the Bremang Gold Dredging explains why the company's profit for the month of June fell to £1,400. This was due to the Number 3 Dredge being closed down on May 22 until June 9 for overhauling and repairs, and also because its No. 1 Dredge was compelled to travel through some unpayable ground in order to close in from the river and raise the water level.

West African Gold Returns in July

The monthly mine returns from nine of the West African gold producers for July published below together with their cumulative totals provide, in the case of six companies which have now completed ten months of their financial year, a reasonable point of departure for assessing what their end-year positions are likely to be compared with the preceding year.

Before attempting any such assessment, however, and since the June quarterly results for those companies in the Gold Coast Selection Trust group are given elsewhere in these columns, it seems to be as good a time as any to remind readers that quarterly figures have been adjusted to take care of any discrepancies there may be in the anticipated realizable value of gold sales and the actual revenue realized. The monthly figures in the case of the companies in this group have not been so adjusted and do not, therefore, provide more than a rough

guide. This explains why their cumulative totals compared to the cumulative totals which can be arrived at by a collation of the figures given in the quarterlies vary.

Of the six companies which have completed ten months of their respective financial year, three of them, Ashanti, Konongo, and Marlu show noticeable improvements over the corresponding period of the preceding year. Ashanti's throughput for July at 24,000 tons was something of a record, as was Marlu's, while Konongo returned a higher monthly profit figure than for a very long time. The other three in this group, A.B.A., Ariston, and Bibiani, have a good deal of leeway to make up to improve on the corresponding figures for the preceding year. However, better monthly figures can be looked for from Amalgamated Banket now that full load deliveries of ore from Fanti to the Central Mill have begun.

G.C. Main Reef has got off to a good start, and Taquah and Abosso continues to maintain the excellent progress shown from the beginning of the year.

Company	July, 1953			Months since year end	Current Financial Year Total to date			Last Financial Year Total to date		
	Tons (000)	Yield (oz.)	Profit* (£000)		Tons (000)	Yield (oz.)	Profit* (£000)	Tons (000)	Yield (oz.)	Profit* (£000)
A.B.A.	56	9,473	21.0	10	600	91,882	182	512	84,866	204
Ariston Gold	29	9,539	38.6	10	289	98,408	454	273	94,885	466
Ashanti	24	15,032	75.4	10	230	149,532	756	184	137,390	660
Bibiani (1927)	31	6,205	7.4	10	303	61,661	116	299	58,991	143
Bremang†	580	2,328	9.5	7	4,148	19,239	87	4,306	21,665	105
G.C.M.R.	9	3,412	9.7	1	9	3,412	10	8	2,697	6
Konongo	3	2,649	13.0	10	25	22,880	105	25	21,773	99
Marlu Gold	45	3,855	11.4	10	420	40,253	128	394	36,724	76
Taquah and Abosso	25	5,862	10.4	4	100	14,314	49	85	19,012	L 39

*Including premium revenue since November, 1951. As the basis of calculating monthly profit varies from company to company a direct comparison one with another is not possible. The basis for any one company has, however, remained consistent, unless otherwise indicated.
†Ore treated given in cu. yd. L indicates a loss.

"Indians" Better Results

The July output returns and seven month cumulative totals for the four Kolar Goldfield Companies show a substantial revival in tonnage milled and gold output compared with the preceding month.

Champion Reef sent more ore to the mill than it has done since May, 1951, although the grade was relatively low. Mysore was in an even better position as both the tonnage milled and the gold production were the highest achieved in any one month during the current year.

Ooregum's production declined further to 5,130 tons but this was no doubt expected as the mine is being merged for working purposes with the adjacent Champion Reef.

Nundydroog also produced its best figures in the current year and looks like being the only one of the four mines with an opportunity of showing improved milling and production results for the whole of the year compared with 1952.

Company	July, 1953		Months since year end	Current Financial Year Total to date		Last Financial Year Total to Date	
	Tons (000)	Yield (oz.)		Tons (000)	Yield (oz.)	Tons (000)	Yield (oz.)
Champion Reef	14	4,317	7	72	29,061	93	41,068
Mysore	18	6,725	7	108	41,467	120	41,964
Nundydroog*	23	6,169	7	141	39,509	146	35,819
Ooregum	5	1,774	7	60	15,683	76	20,558

*Includes tailings.

Company Shorts

Selection Trust acquires substantial shareholding in Vaal Reefs.—Earlier this week it was officially announced that under an agreement with Anglo American Corporation of South Africa, Selection Trust had acquired a "substantial" shareholding in the Vaal Reefs Exploration and Mining Company. Mr. A. Chester Beatty, Jnr., Chairman of Selection Trust, has been appointed a director of Vaal Reefs.

Inco Earns $1.93 a Share in First Half of 1953.—The International Nickel Company of Canada has announced earnings for the first six months of 1953 $29,205,595 (U.S. currency), equivalent to $1.93 per share on the common stock. This figure represents the net earnings of the group for the six months ended June 30 last and was struck after providing for all charges, depreciation, depletion, taxes, etc., and Preferred dividends. In the previous six months' period ended December 31, 1952, net earnings were $25,353,055, or $1.67 per common share. For the corresponding first six months of 1952 net earnings were $33,538,227, or $2.23 per share of common.

In the three months ended June 30 last net earnings were $13,615,044, equal to 90 c. a share on the common, compared with $15,590,551, or $1.03 per share of common, in the first quarter of 1953 and $17,191,909, or $1.15 per share of common, in the second quarter of 1952.

Net sales rose from $87,342,648 during the first quarter of 1953 to $88,760,856 in the second quarter, but increased costs and expenses amounted to $58,077,702 in the second quarter against $54,900,929 in the first quarter, which explains the lower net earnings.

F.S. Geduld Note Issue.—Free State Geduld Mines, which is in the Anglo American Corporation of South Africa group, is to offer at par £4,125,000 at 6 per cent Registered, Unsecured Convertible Notes of a nominal value of 55s. each. Each 55s. Note will be convertible into one ordinary 5s. share until January 29, 1955.

Of the total amount, £2,750,000 will be offered to holders of the current options in the ratio of one new 55s. Note for every option held.

Anglo American Corporation has undertaken to subscribe for the remaining £1,375,000 of Notes, and will make these available to F.S. Geduld shareholders, subject to U.K. Treasury consent, on or before October 30 next. The Anglo American Corporation has also undertaken to subscribe at par for such amount of the Notes as will ensure that the cash received by the company from option holders, whether in respect of the exercise of the options or the subscription of the Notes and from the Corporation, will total £2,750,000. In return for these undertakings Anglo American Corporation will receive a commission of 2½ per cent on the £4,125,000 payable in cash on fulfilment of its obligations to secure for the company that amount. Full terms and conditions of the issue of the Notes will be sent to both shareholders and option holders on or about August 21.

PENGKALEN, LTD.

MR. DONALD W. THOMAS'S REVIEW

The forty-fifth ordinary general meeting of Pengkalen, Ltd., was held on August 7 at the registered office, Redruth.

Mr. Donald W. Thomas (chairman) presided.

The reports and accounts for the year ended September 30, 1952, having been circulated for the prescribed time, were taken as read, as was also the chairman's statement, circulated with the reports and accounts, which was as follows:

Shareholders will observe from the directors' report that Mr. Stanley Wickett has retired from the chairmanship of the Board and that I have been done the honour of being elected to fill his place. I am thankful that Mr. Wickett is remaining on the Board and we hope we may long have the benefit of his counsel and advice.

The amount of tin ore sold during the year was only slightly less than in the previous year, but owing to the fall in the price of tin and the increased cost of working, the revenue from the sales of tin ore was, at £369,240, down by £66,860. As a consequence the net profit carried to appropriation account is £225,247, against £285,874. Of this, £45,675 was distributed in dividends and £127,187 in U.K. taxes.

Outputs for the current year are:

	Tons of tin ore
October-December, 1952	95½
January-March, 1953	66
April-June, 1953	80½

The rate of output is, as was forecasted by the general managers in their report, materially lower than the previous year.

The security position in Malaya continues to improve, but all those who are in our employ are still working under the strain of conditions of potential, if not of actual, danger. We can only repeat our assurance of our great appreciation of the services of our general managers and their staff at the mine.

I should like to repeat here what I said in another statement that despite frequent reports to the contrary, I wish to draw particular attention to the amount of health and welfare services provided by this company and many others in the Colonies by private enterprise. Large sums are expended annually under such headings as Asian staff provident fund, insurance of Asian staff, pensioners, medical, security measures and emergency regrouping.

The statement of accounts and balance-sheet, together with the directors' report, were received and adopted.

Mining Men and Matters

Mr. P. H. Anderson has been appointed chairman of Transvaal Gold Mining Estates in succession to **Mr. G. V. R. Richdale,** who has left the Board. **Mr. E. J. F. Harrington** has joined the Board.

Mr. G. Lindesay Clark has been appointed a director of North Broken Hill.

Mr. K. A. Hogan and Mr. R. L. Lechmere-Oertel have resigned as directors of the Wankie Colliery.

The British Standards Institution has announced that by Monday, August 17, it will be in full operation at its new premises, 2 Park Street, W.1. Tel.: Mayfair 9000.

HER MAJESTY'S COLONIAL SERVICE

A vacancy exists for an Inspector of Mines in the Colonial Mines Service, Tanganyika (CDE. 99/8/01). Age limit—33 years.

Qualifications: University Degree or Diploma of a School of Metalliferous Mining (or similar Dominion qualification) together with minimum of three years post-graduate experience and two years in underground mining.

Duties: Administration of laws as to prospecting and mining and the guidance, control and inspection of mine development and working.

Appointment: On probation to pensionable establishment with salary according to war service and experience in the scale of £655-£1,320 per annum plus an emergency allowance of 30 per cent of salary subject to a maximum of £300 per annum. Outfit allowance £45 on initial salary not exceeding £840 per annum. Income Tax at low local rates.

Quarters: provided if available at rental of 10 per cent of salary. Free passages.

Leave at rate of six days for each month of resident service; medical attention free.

Apply in writing to the Director of Recruitment, Colonial Office, Great Smith Street, London, S.W.1, giving briefly age, qualifications and experience. Mention the reference number CDE. 99/8/01.

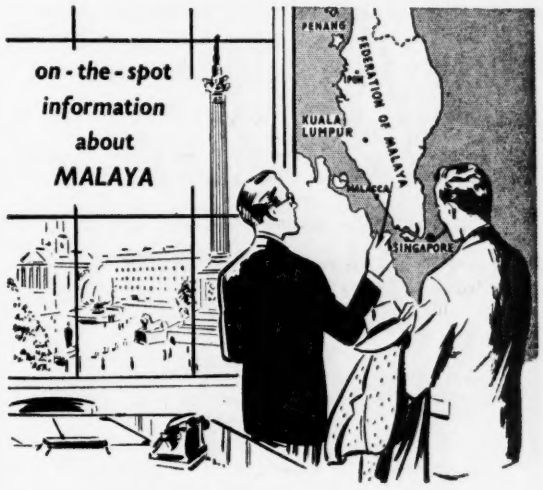
COLONIAL GEOLOGICAL SURVEYS

Directorate of Colonial Geological Surveys invites applications for the following appointments. Post (a) One Principal Scientific Officer (Geophysicist) Ref. A.204/53A. Qualifications: Good Honours degree in Physics or Geology; several years' practical experience of seismic and gravitational prospecting and general knowledge of other methods of geophysical prospecting. Duties initially at London headquarters later considerable periods in Colonial territories. Posts (b) Two Senior Scientific or Scientific Officers (Geologists) Ref. G.273/53A. Qualifications: Good Honours degree in Geology, experience in field mapping, preferably in Colonial or similar territories; some knowledge of photogeological interpretation and mapping from air photographs an advantage. Duties in Photo geological Section, Tolworth, Surrey, mainly interpretation of vertical air photographs and geological map making. Starting Salaries (under review) according to qualifications and experience within scales (London Rates). P.S.O. £1,000 x £40-£1,200 x £50-£1,375, S.S.O. £750 x £30-£950, S.O. £400 x £25-£450 x £30-£650 plus pay addition of 10 per cent on first £500, 5 per cent between £500 and £1,000 and 2½ per cent on remainder. F.S.S.U. superannuation. Other conditions as per United Kingdom Scientific Civil Service. Application forms from M.L.N.S., Technical and Scientific Register (K), 26 King Street, London, S.W.1, quoting appropriate reference. Closing date September 12, 1953.

XANTHATES FOR FLOTATION
of
BRITISH MANUFACTURE
are now available from
ROBINSON BROTHERS LIMITED
Ryders Green, West Bromwich
Telegrams: "Chemicals," West Bromwich. *Telephone:* West Bromwich 2451/2.

The World's Greatest Bookshop
FOYLES
* FOR BOOKS *
Large dept. for Technical Books
New, secondhand and rare Books on every subject. Stock of over 3 million volumes
Subscriptions taken for British, American & Continental magazines
119-125 CHARING CROSS RD., LONDON, W.C.2
Gerrard 5660 (16 lines) * *Open 9-6 including Saturdays*
Two minutes from Tottenham Court Road station

FIRE!
TRAGEDY AVERTED BY
NU-SWIFT!
"Escape seemed impossible . . . chemical machines spluttered and failed . . . acid squirted by one just missed my eyes . . . but reliable, non-damaging Nu-Swift saved us all."
NU-SWIFT LTD · ELLAND · YORKS
In Every Ship of the Royal Navy



Factual information on all matters relating to the **FEDERATION of MALAYA** and **COLONY of SINGAPORE**
Personal or written enquiries are welcomed by
THE COMMISSIONER FOR MALAYA IN THE U.K.
and the TRADE COMMISSIONER
at
MALAYA HOUSE
57 TRAFALGAR SQUARE, LONDON, W.C.2
Telephone: WHitehall 9837 **Telegrams: MALAWAKIL, LONDON**

Metal and Mineral Trades

Contractors for Ores · Concentrates · Residues
containing
LEAD
ZINC · COPPER · ANTIMONY · WOLFRAM

CREECHURCH HOUSE, LONDON, E.C.3
Telephone: AVENUE 5341
Cables: ORMINLAZ LONDON

LEOPOLD LAZARUS LTD

Offices at: SYDNEY, CALCUTTA and JOHANNESBURG

THE COMMERCIAL METAL COMPANY LTD
66 GRESHAM STREET, LONDON, E.C.2
ORES, METALS, ALLOYS, STEEL, CHEMICALS AND ALUMINIUM POWDERS
Telephone: MONARCH 0211 (8 lines) (Members of the London Metal Exchange) Cables: COMETALCO LONDON

MINING & CHEMICAL PRODUCTS, LTD.
MANFIELD HOUSE, 376, STRAND, W.C.2
Telephone: Temple Bar 6511/3 Works: ALPERTON
Telegrams: "MINCHEPRO, LONDON" WEMBLEY, MIDDLESEX
Buyers of Silver Ores and Concentrates
Smelters and Refiners of
BISMUTH
ORES, RESIDUES & METAL
Manufacturers of:
FUSIBLE ALLOYS, SOLDER, WHITE METALS, ANODES OF TIN, CADMIUM and ZINC IN ALL SHAPES
Importers and Distributors of:
ARSENIC . BISMUTH . CADMIUM
INDIUM . SELENIUM . TELLURIUM

ROKKER & STANTON LTD.
DRAYTON HOUSE, GORDON STREET
LONDON, W.C.1
Metal Stockists & Shippers
for
BRASS, COPPER, ALUMINIUM AND NICKEL SILVER
in
Sheets, Rods, Tubes, Strip, Wire, etc.
Associated Companies in Holland and Belgium, also Regd. in South Africa and Rhodesia
Tel: EUS 4751/2 Cables: BENTLY 2nd; A.B.C.6
Grams: ROKKER, WESTCENT, LONDON

EASTERN SMELTING CO. LTD.
CAPITAL—AUTHORISED £500,000: £435,000 ISSUED
Head Office: ST. SWITHIN'S HOUSE, 11/12 ST. SWITHIN'S LANE, LONDON, E.C.4
Telephone: MANsion House 2164/7 Telegrams: TIMAMASA, PHONE LONDON
TIN SMELTERS
BRANCHES THROUGHOUT THE FEDERATION OF MALAYA
Sole Selling Agents: VIVIAN, YOUNGER & BOND, LIMITED, PRINCES HOUSE, 95 GRESHAM STREET, LONDON, E.C.2
Telephone: MONarch 7221/7

ROURA & FORGAS, LTD. Telephone No: GERRARD 9641

Sole Sterling Area Suppliers of

ITALIAN QUICKSILVER

PRODUCED BY MONTE AMIATA, S.M.P.A.

COLQUHOUN HOUSE,
27/37 BROADWICK STREET, LONDON, W.1

MAYBANK METALS LTD.

This Company backed with the vast experience gained in a 100 YEARS of progressive trading, will expedite all orders . . .

THE BUYING OF MIXED OR SORTED NON-FERROUS SCRAP METALS and Supplying of Finely Graded Non-Ferrous Scrap to Your Requirements.

MAYBANK METALS LTD.

STAR WORKS, SPURGEON STREET, SOUTHWARK
LONDON, S.E.1 Telephone: HOP 2432/3 HOP 4212/3/4

H. BARNETT LTD.

VICTOR ROAD, LONDON, N.7.
IMPORT : EXPORT
Phone: ARCHWAY 5461 (5 lines) Established 1865
WE SPECIALISE IN ALL NON-FERROUS SCRAP AND INGOT METALS

LEO RAPP LTD. *Buyers and Sellers*
NON-FERROUS METALS

METAG LTD.
NON-FERROUS TUBES

LEO RAPP (Steel) LTD.
STEEL STOCKISTS

All at: **60a PURLEY AVENUE, LONDON, N.W.2**
Telephone: GLAdstone 6393/4/5/6

EVERITT & Co. LTD. 40 CHAPEL STREET LIVERPOOL
Teleg. Address: Persistent, Liverpool Phone: 2995 Central
SPECIALITY

MANGANESE PEROXIDE ORES,

We are buyers of:—
WOLFRAM, SCHEELITE, MOLYBDENITE
VANADIUM, ILMENITE, RUTILE,
ZIRCONIUM and TANTALITE ORES

Suppliers of:—
FERRO-ALLOYS & METALS NON-FERROUS ALLOYS

LEONARD COHEN LTD.

GOLD, SILVER AND THE PLATINUM METALS
ORES, CONCENTRATES AND RESIDUES
METAL HARDENERS
NON-FERROUS METAL INGOTS

London Office: I HAY HILL, W.1
Telephone: GROSVENOR 6284

Works: PORTH, GLAM
Telephone: PORTH 280

ENTORES, LIMITED
KINGS HOUSE, 36 & 37 KING STREET,
LONDON, E.C.2

NON-FERROUS METALS
ORES · RESIDUES

Telegrams: Entores, Phone, London
Telephone: MONarch 341

HENEAGE METALS
for Quality Ingots IN BRASS, GUN METAL & PHOSPHOR BRONZE.
PHONE ASTON CROSS 1177/8
HENEAGE METALS LTD. HENEAGE ST. BIRMINGHAM

THE STRAITS TRADING
COMPANY, LIMITED
Head Office:
P.O. Box 700, OCEAN BUILDING, SINGAPORE
Works:
SINGAPORE & PENANG
"The Straits Trading Co., Ltd."
Brand of Straits Tin

THE BRITISH TIN SMELTING
COMPANY, LIMITED
Works: LITHERLAND, LIVERPOOL
Smelters of Non-ferrous Residues and Scrap

London Agents:
W. E. MOULSDALE & CO., LTD.
2 Chantrey House, Eccleston Street, London, S.W.1
Cables: Wemoulanco, London Telephone: SLOane 7288/9

THE BRITISH METAL CORPORATION LTD.
BMC

LONDON · MONTREAL · TORONTO
VANCOUVER · SYDNEY · PERTH
MELBOURNE · CALCUTTA · BOMBAY
KARACHI · LAHORE · JOHANNESBURG
SALISBURY · BULAWAYO

ASSOCIATES :

C. TENNANT, SONS & CO. OF NEW YORK, NEW YORK
VIVIAN YOUNGER & BOND LIMITED, LONDON AND NIGERIA
HENRY GARDNER & CO. LIMITED, LONDON, CANADA AND MALAYA

The Group trades in and markets non-ferrous ores, metals and minerals, many kinds of produce, timber and other materials ; it provides coal-washing plant, ventilation plant and other specialist engineering equipment; and it furnishes allied shipping, insurance, secretarial, financial, technical and statistical services.

PRINCES HOUSE
93 GRESHAM STREET, LONDON, E.C.2

TELEGRAMS : *Brimetacor, London* CABLES : *Brimetacor, London* TELEPHONE : *MONarch* 8055
Branches at BIRMINGHAM and SWANSEA

Sellers of
GRADED SCRAP & RE-MELTED SPELTER
Buyers of
NON-FERROUS METALS, RESIDUE SCRAP & ORES
FOR KEENEST PRICES & MOST SPEEDY SERVICE CONTACT
ELTON LEVY
& COMPANY LIMITED
Head Office: 1-4 St. Ermin's (West Side) Caxton St., London, S.W.1
Phone: ABBEY 6582/3/4 Grams: Eppenleco, Sowest, London

GEORGE T. HOLLOWAY Co. LTD.
Metallurgists & Assayers
ORE TESTING, WORKS AND METALLURGICAL RESEARCH LABORATORIES
Atlas Road, Victoria Road, Acton, LONDON, N.W.10
Telephone : ELGAR 5202 *Grams and Cables :* NEOLITHIC LONDON

DEERING PRODUCTS LTD.
8 GREAT SMITH STREET, LONDON, S.W.1
ORES - MINERALS - REFRACTORY RAW MATERIALS
Telephone : ABBEY 2681/2 Cables : PRODEERING, LONDON

ZINC SHAVINGS
GRANULATED & POWDERED NON-FERROUS METALS
" Lead Wool " for Pipe-jointing.
Metallic Packing for Pumps, etc.
THE LEAD WOOL CO., LTD.
SNODLAND KENT
Telephone: Snodland 84216 & 7 Telegrams: " Strength, Phone, Snodland "

we buy
CONCENTRATES
ORES RESIDUES
containing
Base and Precious
METALS

E. M. JACOB & CO. LTD.
Members of the London Metal Exchange
HANOVER HOUSE, 73-78 HIGH HOLBORN, LONDON, W.C.1
Telephone CHAncery 3625 (5 lines) *Cables:* JACOMETA, LONDON

Smee's 3821

For Optimum Hardness and Strength

NITRIDED NITRALLOY STEEL

Particulars from:

NITRALLOY LIMITED, 25 TAPTONVILLE ROAD, SHEFFIELD, 10

Telephone: 60689 Sheffield Telegrams: Nitralloy, Sheffield

International Smelters and Buyers of

NON-FERROUS SCRAP METALS AND RESIDUES

TIN
LEAD
WHITEMETAL
SOLDER
GUNMETAL
COPPER

THE EYRE SMELTING CO LTD

Tandem Works, Merton Abbey, London, S.W.19

Phone: Mitcham 2031 Wire: Eyrsmeltin, Phone, London

PLATT METALS LTD.

METAL MANUFACTURERS and MERCHANTS

Buyers of

BRASS ROD SWARF AND SCRAP, and all descriptions of NON-FERROUS SCRAP METALS, BORINGS AND RESIDUES

Sellers of

BILLETS AND INGOTS TO ANY REQUIRED COMPOSITION, GRADED NON-FERROUS SCRAP METALS

METALEX WORKS, Great Cambridge Road, ENFIELD, Mddx.

Telephone: HOWard 3351 (5 lines) Telegrams: Walton, Enfield

250 *Pages* *Price* 7/6 ($1·00)

The Mining Journal

ANNUAL REVIEW — 1953 EDITION

IS NOW ON SALE :: PRICE 7/6

This comprehensive Review which—like the weekly issue of the MINING JOURNAL—is read in over 60 countries, contains over 100 articles falling into the following main groups:

- **Technical Developments in the Mining Industry.** Separate articles deal with the latest advances in Exploration, Mining, Ore Dressing, Reduction and Refining, and in Alloys and Metallic Powders.
- **Economic Review of the Metals** including articles on Gold, Silver, Platinum, Copper, Tin, Lead, Zinc, Aluminium, Magnesium, Titanium, Nickel, Cobalt, Manganese, Molybdenum, Tungsten, Vanadium, Columbium, Tantalum, Beryllium, Antimony, and Asbestos; also Iron and Steel, Coal, Oil, and Diamonds.
- **Country by Country Review of the Mining Industry during 1952,** including despatches from our correspondents in South Africa, South-West Africa, Southern Rhodesia, Northern Rhodesia, East Africa, Congo, Mozambique, Canada, United States, Brazil, Australia, Malaya, India, Ceylon, Spain, Portugal, and Norway.

  Also articles giving authoritative reports on progress in Bolivia, Argentina, the Caribbean, Indonesia, Yugoslavia, and the United Kingdom.
- **Progress Reports on over 100 of the Empire's principal Mining Companies.**

Orders may be placed through Newsagents or sent direct to :—

THE PUBLISHER, The Mining Journal, 15 Wilson Street, Moorgate, London, E.C.2

Subscribers to the weekly edition receive the Annual Review automatically, without further payment.

...going fishing or DRILLING ?

Fishing has its place in life - as a relaxation for leisure hours. But it's no pleasure spending good drilling time "fishing" for broken rods. Rod breakages arise from many factors but, when you use Rip Bits equipment, you can be sure to keep your "fishing" down to a minimum. For the straight run or for the awkward spots it's a Rip Bits job for drilling.

A Bit for EVERY drilling job

RIPLOY DETACHABLE CARBIDE BITS & TIPPED STEMS
RIP BITS
P. M. BITS
DRILL RODS

RIP BITS LIMITED

R B

A Subsidiary of PADLEY & VENABLES LTD., Sheffield and Birmingham
HILL STREET, SHEFFIELD 2 Telephone: 26706

London Office:
66 Victoria Street, London, S.W.1
Telephone: TATe Gallery 0752-3

HUWOOD

TOP & BOTTOM LOADING BELT CONVEYORS

Conveyors for every output.

HUWOOD

Conveyors for every output.

Head Office & Factories:
HUGH WOOD & CO. LTD., GATESHEAD - ON - TYNE 11.
Industrial & Export Office:
DASHWOOD HOUSE, 69, OLD BROAD STREET, LONDON, E.C.2.
TELEPHONE: LONDON WALL 6431-2-3 TELEGRAMS: HUWOOD, AVE, LONDON.

Published by The Mining Journal Ltd., 15 Wilson Street, Moorgate, London, E.C.2, and printed by Washburn & Sons Ltd., 25-27 Queens Road, Southend-on-Sea, Essex. Registered as a Newspaper.